

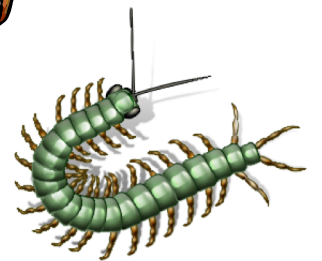
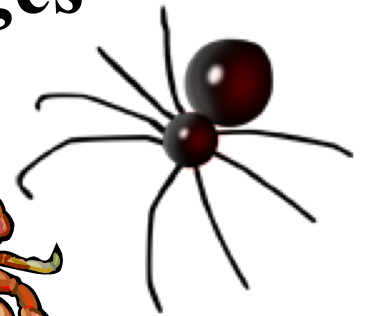


# Common Insect Orders of the Wenatchee Watershed

Text and photos by Susan Ballinger. Photos of  
specimens from the collection of Dr. Robert  
Gillespie, Wenatchee Valley College

# What is an Insect?

- **Phylum Arthropoda** – invertebrate animals
- Have **exoskeletons** –supportive outer covering
- Have **segmented** bodies
- Have at least 3 pairs of **jointed appendages** (legs)
- **CLASSES** include:
  - Arachnida (spiders)
  - Crustacea (crabs)
  - Myriopoda (millipedes & centipedes)
  - Insecta (insects)



# What is an Insect?

## Phylum Arthropoda Class Insecta

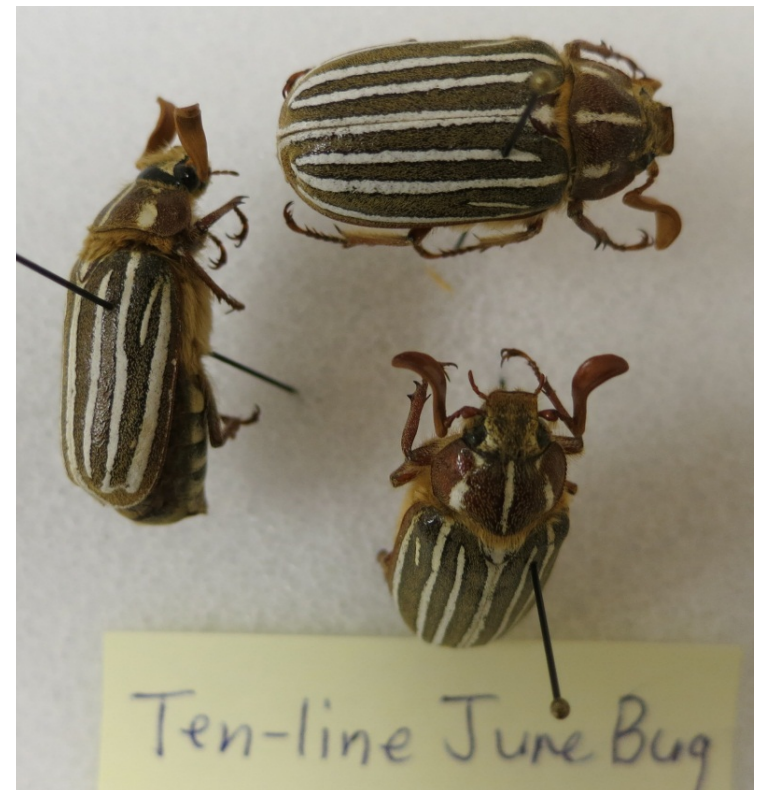
All insects have:

Have 3 distinct body regions –  
head, thorax, abdomen

No more than 3 pairs of legs

1 pair of antennae

Class Insecta is divided  
into 29 Orders based  
on physical traits



# What is an Insect?

## **HEAD has**

**Antennae:** used for touch, smell, and/or hearing (in some)

**Eyes:** most have 2 types of eyes- compound & simple

**Mouthparts:** 1 pair of jaws (mandibles) for biting & chewing, or modified into a proboscis or beak for lapping, piercing, or sucking in some insect orders



# What is an Insect?

**THORAX:** has  
**Legs:** divided into  
3 main segments

**Wings** (when  
present) Most  
adults have 2 pairs  
& at least one pair  
is membranous  
with a series of  
thicken ridges  
(veins)



# What is an Insect?

## **ABDOMEN Has**

Usually have 11 segments

Terrestrial: Pairs of breathing holes (spiracles) line the sides

Aquatic: Immatures of insects (naiads) have gills on abdomen

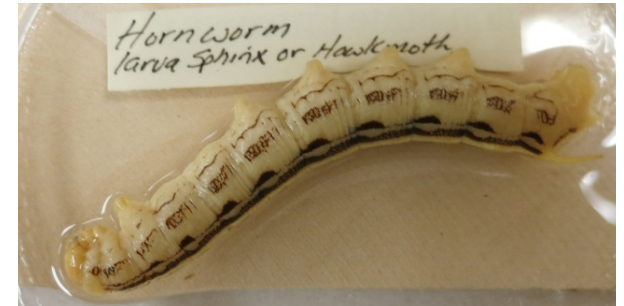
In many species, females have an ovipositor (to lay eggs)



# What is an Insect?

## Growth and Development-

- Different growth forms from egg to immature to adult insect
- Usually eat different foods & live in different habitats



## **Most species undergo COMPLETE METAMORPHIS (4 stages)**

Egg

Larva- main feeding stage

Pupa- resting stage; body reorganizes into adult form

Adult

## **Some species undergo INCOMPLETE METAMORPHIS (3 stages)**

Egg

nymph – major feeding stage. Lack functional wings

adult

# Order Odonata – dragonflies & damselflies

Odonata means “Toothed jaws” Traits :

- extremely large eyes in proportion to the head
- long slender abdomen
- Primitive wings that can't be folded. Each wing can be operated independently with ability to hover, fly backwards, and take off vertically (like a helicopter)
- Predacious.- eats insects Large chewing mandibles
- Eggs laid in fresh water; Aquatic larvae called “naiads” have gills and molt many times. Some remain in water for up to 2 years before becoming winged adults.

Dragonfly adult



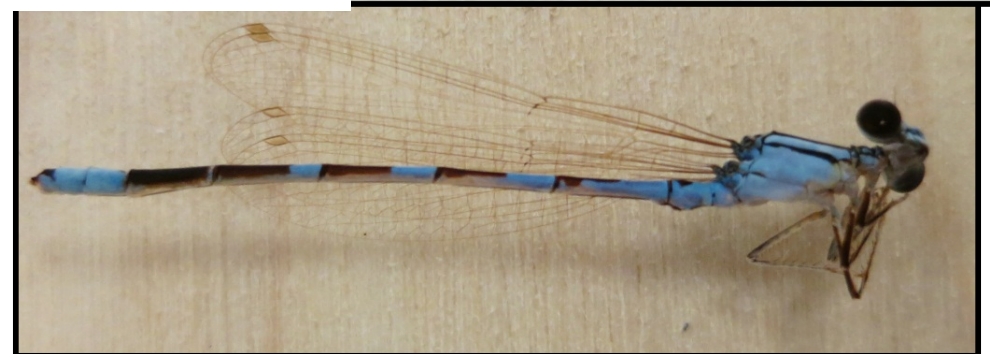
Dragonfly naiad



Damselfly naiad



Damselfly adult





# Order Ephemeroptera - mayflies

Ephemeroptera means “short-lived wing” Traits:

- Adults live on land 1-2 days, long enough to mate, often in swarming flights
- Females deposit eggs on the surface of a pond or stream, or object in water.
- Eggs hatch into nymphs that feed on algae and detritus.
- Nymphs are aquatic and live 1-2 years before emerging as winged adults.
- Habitat: fast flowing streams and shallow ponds with high levels of dissolved oxygen.



# Order Coleoptera - beetles

Coleoptera means “sheath wings” Traits :

- Hardened forewings (elytra) cover the body and protect delicate hindwings
- At rest, elytra meet in a straight line down middle of the back
- Hind wings used for flight, elytra held out for balance
- Chewing mouthparts
- >350,000 species worldwide
- At least 25% of all animal species on earth
- Highly varied in size, eating habits, habitats



Darkling beetle



Long-horned beetle



June beetle



Ladybird beetle



# Order Plecoptera - stoneflies

Plecoptera means “twisted wing” Traits:

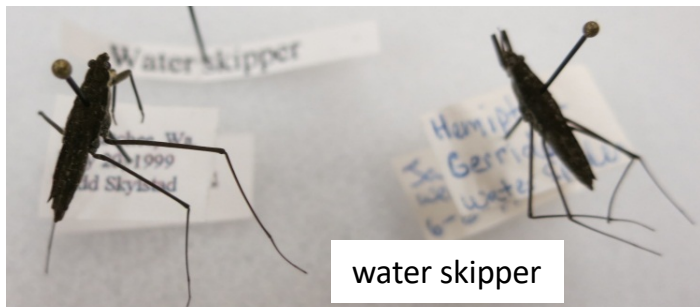
- Adults: flattened soft bodies. hold wings flat over body at rest
- Adults are poor fliers and stay near the stream after emerging
- Chewing mouthparts
- Mating adults “drum” their abdomens on a surface
- Habitat: cold, fast-flowing streams.
- Food: plants and animals, dead and living
- Eggs deposited in freshwater. Nymphs live under stones for 1-3 yrs.



# Order Hemiptera – true bugs

Hemiptera means “half wing” Traits:

- Named for fore wings that are hardened near the base, and membranous near the ends
- Hind wings entirely membranous (Lacking in some)
- When at rest, fold all 4 wings over each other, resulting in an “X” pattern
- Mouthparts are modified for piercing and sucking.
- Many feed on plant fluids
- Diverse order with widely varied habitats worldwide



# Orthoptera – grasshoppers & crickets

Orthoptera means “straight wings” Traits:

- Have leathery front wings, and underneath, expandable membranous hind wings that enable flight. Have long slender antennae.
- Have well-developed hindlegs designed for jumping and tough, leathery bodies.
- Have a prominent “saddle (pronotum)” that wraps over the body to cover the sides of the thorax.
- Have auditory organs (tympana) located on the abdomen (grasshoppers) or on the front legs (crickets and katydids). Known for their noisy “singing” produced by rubbing one body part against another, mostly mating songs of males.
- Include herbivores, predators, or omnivores with chewing mouth parts.
- Found world-wide, often in open habitats.

Photos: Lisa Robinson



# Order Neuroptera net-winged insects

Neuroptera means “ net-wing: Traits:

- 4 membranous wings: all about the same size , usually longer than abdomen.
- Wings have many-branched longitudinal veins connected by many cross veins..
- Wings usually held rooflike over body at rest.
- Generally not strong fliers. Legs well developed
- Antennae very long, many segmented. Great variety in form.
- Chewing mouthparts.
- Predaceous (at least in larval stage)
- Most species are terrestrial, adults found near larval habitat



lacewing

Green lacewing



snakefly



Green Lacewings (Neuroptera: Chrysomelidae)



antlion

Antlion; Myrmeleontidae  
R.T Perry's C.A. 8-4-01

# Order Hymenoptera – wasps, bees, ants

Hymenoptera means “membrane wing” Traits:

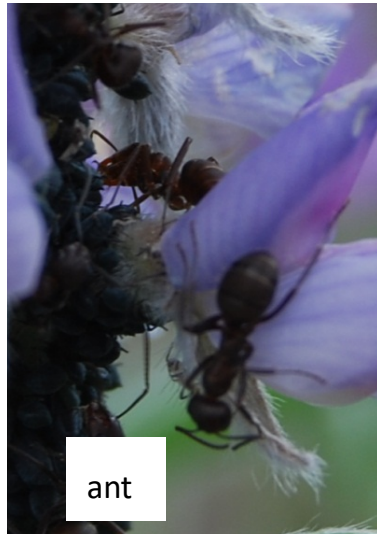
- Great diversity in habitat and behavior, includes the social insects
- Most adults winged with 2 pair of membranous wings with few veins
- Many have a constricted “waist” between thorax and abdomen.
- Most, have chewing mouthparts (some, modified to lap or suck fluids)
- In most bees, predatory wasps, and some ants, ovipositor modified to a stinger.
- Social behavior ranges from solitary to a complex class-based organization.
- In many species- adults feed on pollen and nectar; others prey on other insects for the purpose of providing food for developing larvae.
- Many species have larvae that are internal or external parasites on other insects.
- Many are important pollinators, and maintain plant diversity and crop production.



honey bee



paper wasp



ant



carpenter ant

# Order Lepidoptera – butterflies & moths

Lepidoptera means “scale wing” Traits:

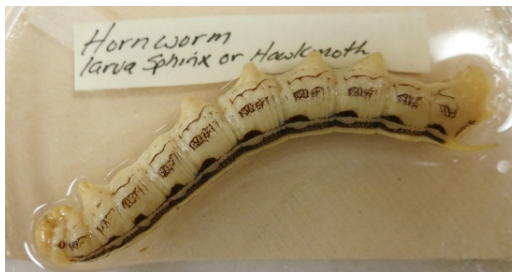
- Overlapping scales cover their two pairs of large membranous wings, body & legs.
- Forewings usually larger than hind wings. Scales give color and texture.
- Adults of most species have sucking mouthparts, modified to form a long coiled tube, or proboscis, kept tucked under head when not in use.
- Larvae have chewing mouthparts and eat plants.

## Moths:

- At rest, **hold wings** either rooflike over the body, curled around body, or flat against the resting surface.
- **Antennae** are serrate or feathery and taper to a point.
- Most fly during night and have subdued colors.

## Butterflies:

- At rest, **hold wings** together vertically over the body.
- Slender **antennae** with enlarged club at the tip.
- Fly during daytime





# Order Diptera – 2 winged true flies

Diptera means “two wing” Traits:

- Have only 1 pair of wings (forewings)
- The 2<sup>nd</sup> pair of wings is absent, or reduced to small knobbed balancing organ.
- Membranous forewings usually translucent with relatively few veins.
- Prevalent in most habitats and are often the first flying insects to emerge in spring
- Usually day active; feed on a wide variety of plants and animal fluids
- Mouthparts modified for feeding on liquids by piercing, sucking, lapping, or sponging.

