

The Eight Major Orders of Insects

There are 26 orders of insects, but the vast majority belong to only these eight. Below is a short guide to the identification of the eight major orders.

Beetles *Coleoptera* (“sheath wings”)

- largest order of living things with over 290,000 species known worldwide
- two pairs of wings, but the outer pair is hardened covering the top of the body and meeting in a straight line down the back.
- have “chewing jaws”
- metamorphosis is complete

Moths, Butterflies *Lepidoptera* (“scaly wings”)

- second largest order of insects (beetles are #1) - mostly moths
- two pairs of wings covered with small scales that rub off easily
- only insects with sucking mouth parts in the form of a *coiled tube*.
- in the larval stage, most butterfly and moth species feed on leaves, often of a particular plant or related group of plants
- metamorphosis is complete

Bees, Wasps, Ants *Hymenoptera* (“membrane-winged”)

- third largest order.
- have 2 pairs of thin, clear, membranous wings.
- females have a well-developed egg-laying organ and/or stinger at the end of their abdomen
- ants have wings only at certain stages of life, some have stingers, too
- considered the most highly evolved order of insects.
- Most wasps are parasites; their young hatch and develop inside the bodies of other insects or spiders. These parasites are our chief ally in the control of many pest insects.
- Bees and wasps are important pollinators of food crops and other plants.
- metamorphosis is complete

Flies, Mosquitoes, Gnats *Diptera* (“two wings”)

- fourth largest order (third in North America)
- if an insect has just one pair of wings, it is a fly of some kind.
- all adult flies have sucking mouth parts
- metamorphosis is complete

Crickets, Grasshoppers, Locusts *Orthoptera* (“straight wings”)

- thin, leathery forewings that cover larger hind wings that are folded like a fan when at rest.
- important food for birds and other insect eaters.
- metamorphosis is gradual

Dragonflies, Damselflies *Odonata* (“tooth”)

- 2 pairs of long, narrow, membranous wings that are roughly equal in size.
- they also have large eyes and extremely long, narrow abdomens.
- *at rest, dragonflies hold wings out flat, while damselflies hold wings together above their bodies.*
- adults feed on other insects (gnats, mosquitoes)
- metamorphosis is gradual

Aphids, Cicadas, Leafhoppers *Homoptera* (“same wings”)

- 2 pairs of membranous wings that are held in a tent-like or rooftop position over the body when at rest.
- adults (except Cicadas) feed on plant sap
- metamorphosis is gradual

Bugs, Backswimmers, Water Striders *Hemiptera* (“half-wings”)

- identified by a triangle on the back just behind the head. This is formed by the way the insects fold their forewings when at rest.
- 2 pairs of wings; hind wings are membranous, while the basal half of the forewings is hardened.
- metamorphosis is gradual

OTHER INSECTS OF IMPORTANCE TO IVY CREEK TOURS

Termites: small, soft-bodied, pale with short, straight antennae. Flying forms have 2 pairs of wings. Do not have constricted waist like ants. Have sophisticated societies - the queen may live 10 years. Most of the 41 species live in the SE. Eat cellulose of the wood fibers making them bad for buildings but *valuable for breaking down dead wood in the forests.*

Springtails: tiny, wingless with prominent antennae. Forked structure allows them to “spring” into the air. Among most abundant creatures on earth, millions per acre. *Immensely beneficial in breaking down leaf litter and fungi into soil components.* Include “snow fleas.”

Bristletails: wingless, crawling, terrestrial with long segmented antennae and 3 long “tails”. Include silverfish and firebrats. *Eat decaying plants outdoors and starchy substances including books, wallpaper and clothing indoors.* Among the most primitive of insects.

reference: Peterson First Guides / Insects by Christopher Leahy
Observing Insect Lives by Donald Stokes, 1983