

Insects and People

Entomology 101 - The Actors

Insect Taxonomy

Read:

Field Guide to the Insects - the whole book!

Information on the Orders of Insects

1. The insects can be variously divided into 30 or 31 orders (more or less) depending on the criteria of importance to the person developing the ordinal divisions. We will not cover them all.
2. You have several sources concerning insect classification at the ordinal level (and beyond) including:
 - a. Class lectures
 - b. Your Field Guide to Insects -- an excellent source of information and illustrations

Some terminology concerning wings (or the lack thereof)

1. **Primitively Wingless** - organisms, the ancestors of which have never possessed wings. All ametabolous insects.
2. **Secondarily Wingless** - organisms, the ancestors of which did have wings. The wings have been "lost" to better fit a lifestyle.
3. **Brachypterous** - organisms in which the wings have been shortened and may or may not be functional.

Insect Orders

1. Order Thysanura
the bristletails
 - a. ametabolous
 - b. primitively wingless, body covered with scales
 - c. chewing mouthparts, feed on starchy substances - may be economic concern
2. Order Ephemeroptera
the mayflies
 - a. incomplete metamorphosis
 - b. immature stage is aquatic, called a naiad
 - c. chewing mouthparts in immatures which feed on decaying vegetation - adults do not feed
 - d. the adult period is very short (thus the term ephemeral).
 - e. important in aquatic and terrestrial food chains

3. Order Odonata
the dragonflies and damselflies
 - a. incomplete metamorphosis
 - b. immature stage is aquatic, called a naiad
 - c. chewing mouthparts in immatures and adults which are both predaceous
 - d. unusual mating configuration

4. Order Orthoptera
the grasshoppers, locusts, katydids, and crickets
 - a. incomplete metamorphosis
 - b. immature called a nymph
 - c. chewing mouthparts in both adults and immatures which feed on plant material or are omnivorous - some can be serious pests
 - d. some produce sound through stridulation

5. Order Mantodea
the praying mantids (mantid or mantis)
 - a. incomplete metamorphosis
 - b. chewing mouthparts in immatures and adults both of which are predaceous
 - c. eggs deposited in a case called an oöthecum

6. Order Blattaria
the cockroaches
 - a. incomplete metamorphosis
 - b. chewing mouthparts in adults and immatures both of which are omnivorous - can become serious pests or just a plain nuisance
 - c. more tropical than temperate in distribution
 - d. eggs usually deposited in a case called an oöthecum

7. Order Isoptera
the termites
 - a. incomplete metamorphosis
 - b. chewing mouthparts, feed on cellulose with aid of internal (gut) symbionts
 - c. social insects with queen, king, soldiers, and workers
 - d. termites are not white ants
 - e. termites are associated with the soil
 - f. very beneficial under natural conditions - a serious pest when they share human environments

8. Order Dermaptera
the earwigs
 - a. chewing mouthparts, earwigs do not (usually) enter the ear

9. Order Phthiraptera

the chewing and sucking lice

- a. incomplete metamorphosis
- b. chewing lice (Mallophaga) found mainly on birds - feed on bits of feather, hair, or skin debris - have chewing mouthparts
- c. sucking lice (Anoplura) found mainly on mammals (including humans) - have piercing/sucking mouthparts - feed on blood
- d. lice are secondarily wingless
- e. eggs called nits when glued to hairs
- f. a single lice is a louse

10. Order Hemiptera

the true bugs

- a. incomplete metamorphosis
- b. front wing is half membranous and half leathery
- c. piercing/sucking mouthparts, feeding habits varied and include plant juices, blood (including human), and other insects (as predators). Depends on the species of bug
- d. several groups (families) of hemipterans are aquatic

11. Order Homoptera

the hoppers, psyllids, whiteflies, aphids, and scale insects

- a. incomplete metamorphosis
- b. often combined with the Hemiptera into a single order
- c. front and hind wings are membranous and similar
- d. piercing/sucking mouthparts, all feed on plant juices
- e. order contains some serious plant pests
- f. honey dew

12. Order Neuroptera

the lacewings and others

- a. complete metamorphosis
- b. chewing mouthparts, immatures of lacewings can be important, beneficial predaceous insects
- c. some important biological control organisms

13. Order Coleoptera

the beetles

- a. complete metamorphosis
- b. the largest order of insects with over 300,000 described species (many more await description)
- c. immatures (called larvae) and adults both have chewing mouthparts - however, they may feed in very different places
- d. in adults, the front wings are hardened and serve a protective purpose - they are called elytra
- e. beetles feed on all types of organic matter including carrion, plant matter, and dung - very important in the recycling community; some a very serious pests

14. Order Siphonaptera
the fleas
 - a. complete metamorphosis
 - b. immatures found in nests and bedding of host where they feed on dried blood, fecal material, and other organic products
 - c. adults with piercing/sucking mouthparts - all adults are blood feeders - most feed primarily on rodents
 - d. secondarily wingless
 - e. on an historical scale, the most devastating of the insect pests

15. Order Diptera
the true flies (including mosquitoes, gnats, and midges)
 - a. complete metamorphosis
 - b. ecologically a very diverse group - occur in almost all terrestrial and aquatic habitats - immatures (larvae) feed in (on) almost all types of organic matter including vegetation, carrion, dung, and blood, and living animal tissue
 - c. hind wings have been modified into structures called halteres
 - d. mouthpart types in adults include piercing/sucking, sponging, cutting/sponging - immatures (larvae) are primarily scrapers

16. Order Lepidoptera
the moths, butterflies, and skippers
 - a. complete metamorphosis - immature (larva) is usually called a caterpillar.
 - b. mouthparts of larvae are of the chewing type - feed primarily on plants -- adults have siphoning mouthparts - feed primarily on plant nectar
 - c. often the subject of folklore
 - d. some caterpillars are extremely destructive pests

17. Order Hymenoptera
the sawflies, bees, wasps, and ants
 - a. complete metamorphosis
 - b. immatures and adults are varied in feeding habits but are primarily plant feeders (including nectar and pollen) or predators
 - c. mouthparts in immatures are of the chewing type - adults with chewing/lapping or other modified mouthparts
 - d. some are highly social species (e.g., honey bees, yellowjackets, paper wasps)
 - e. among the most beneficial of the insects because of pollination activities and biological control potential