



HEMIPTERA

Suborder Homoptera

**Leafhoppers, Planthoppers,
Treehoppers, Cicadas, Aphids,
Psyllids, Whiteflies, Scale Insects**

The name Homoptera, derived from the Greek "*homo-*" meaning uniform and "*ptera*" meaning wings, refers to the uniform texture of the front wings.

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Life History & Ecology:

All members of the suborder Homoptera have piercing/sucking mouthparts and feed by withdrawing sap from vascular plants. The proboscis is shorter than that found in true bugs (suborder Heteroptera), and it emerges near the ventral posterior margin of the head capsule (opisthognathous). Although some Homoptera are secondarily wingless, the majority have membranous or uniformly textured wings that fold tent-like over the body at rest.

It is difficult to generalize about the biology of these insects. Cicadas are the largest members of the suborder. As nymphs, they live underground and feed on the roots of trees and shrubs. Some species complete development in as little as four years, but others have a 13- or 17-year life cycle. In contrast, the aphids are tiny, soft-bodied insects with multiple generations per year. Many species have complex life cycles involving more than one host plant. Winged and wingless forms of the same species may develop at different times of the year. Asexual reproduction (parthenogenesis) is common and males are unknown in some species. The scale insects are even more specialized. During much of their life cycle, they remain immobile, living beneath an impervious cover of wax or cuticle that they secrete over themselves. Legs and antennae often disappear after the first molt. Only newly hatched nymphs and adult males bear any resemblance to other insects. Females grow to sexual maturity, mate, produce offspring, and die without ever leaving their protective cover.

In most of the Homoptera, a portion of the digestive system is modified into a filter chamber. This structure allows the insects to ingest and process large volumes of plant sap. Excess water, sugars, and certain amino acids bypass most of the midgut and are shunted directly into the hindgut for excretion as honeydew. Only a small volume of filtered plant sap passes through the midgut for digestion and absorption. Many species of ants are attracted by the honeydew and provide care and protection for the homopterans in exchange for the honeydew they excrete.

Distribution:

Abundant worldwide. All species are terrestrial herbivores.

	North America	Worldwide
Number of Families	38	60
Number of Species	6359	>32,000

Classification:

Hemimetabola
incomplete development (egg, nymph, adult)

Hemipteroid
closely related to Thysanoptera and Psocoptera

Physical Features:



Adults:

1. Antennae slender or bristle-like
2. Proboscis short, arising near lower back margin of head
3. Front wings, when present, uniform in texture; at rest, wings fold tent-like over the abdomen
4. Tarsi 1- to 3-segmented

Immatures:

1. Structurally similar to adults
2. Always lacking wings

Economic Importance:

Homoptera are among the most abundant herbivores found in terrestrial habitats. Many species are pests of cultivated plants. Aphids and leafhoppers are

important carriers of plant diseases.

Major Families:

- **Cicadidae** (Cicadas) -- Nymphs live underground where they feed on the roots of trees and shrubs. Adults are the largest members of the Homoptera. Males produce loud songs to attract a mate.
- **Cicadellidae** (Leafhoppers) -- This is the largest family of Homoptera and includes many pests of cultivated plants. Leafhoppers are important carriers of plant diseases -- especially mycoplasmas.
- **Membracidae** (Treehoppers) -- Ecologically similar to leafhoppers, these insects have a large pronotum that extends over most of the body. They often resemble thorns or small twigs.
- **Cercopidae** (Spittlebugs or Froghoppers) -- Nymphs live on plant stems and produce a frothy defensive secretion around themselves. Adults are similar to leafhoppers in size and general appearance.
- **Fulgoridae** (Planthoppers) -- This is one of eleven families classified as planthoppers (superfamily Fulgoroidea). These insects are ecologically similar to leafhoppers and treehoppers. Many species are oddly shaped and cryptically colored.
- **Psyllidae** (Psyllids or Jumping Plant Lice) -- Small, aphid-like insects with 3-segmented beaks and 10 segmented antennae. Many species are covered with a woolly layer of wax.
- **Aleyrodidae** (Whiteflies) -- Body and wings of adults are covered with a white powdery wax. Nymphs attach to the undersides of leaves and become immobile, resembling scale insects.

- **Aphididae** (Aphids, Plantlice) -- Second largest family in the suborder Homoptera. Many of these insects are pests of cultivated plants. Aphids are considered the most important carriers of viral plant diseases.
- **Coccidae** (Soft Scale insects) -- This is one of 17 families that make up the superfamily Coccoidea (scale insects and mealybugs). Most species are sedentary during most of their life cycle and secrete a protective covering over their bodies. These insects are among the most common pests of cultivated plants.

Fact File:

- A scale insect, *Laccifer lacca*, is the source of natural shellac. The insect lives on various fig trees in the tropics.
- *Dactylopius coccus*, the cochineal insect, is the source of a bright red dye formerly used in the textile industry. It is a scale insect that lives on prickly pear cacti.
- Aphids in the subfamily Pemphiginae are gall-makers. The galls are usually open at one end so the insects can come and go freely.
- The ground pearls (family Margarodidae) are a group of scale insects that live on plant roots. In some tropical species, the females form large wax cysts, often bronze or gold in color, that people collect and use as beads.
- Honeydew, an excretory product that is rich in sugars and amino acids, is produced by many species of Homoptera. Other animals use honeydew as a source of food.
- Honeydew from a mealybug, *Trabutina mannipara*, is regarded as the probable source of Biblical manna.

Hot Links and Illustrations:

- [Gordon Ramel's Hemiptera Page](#)
- [Ecowatch Hemiptera Page](#)
- [Tree of Life Web Project - Hemiptera](#)
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