

HEMIPTERA

Suborder Heteroptera



True Bugs

The name Heteroptera, derived from the Greek "*hetero-*" meaning different and "*ptera*" meaning wings, refers to the fact that the texture of the front wings is different near the base (leathery) than at the apex (membranous).

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Life History & Ecology:

Members of the suborder Heteroptera are known as "true bugs". They have very distinctive front wings, called **hemelytra**, in which the basal half is leathery and the apical half is membranous. At rest, these wings cross over one another to lie flat along the insect's back. These insects also have elongate, piercing-sucking mouthparts which arise from the ventral (hypognathous) or anterior (prognathous) part of the head capsule. The mandibles and maxillae are long and thread-like, interlocking with one another to form a flexible feeding tube (proboscis) that is no more than 0.1 mm in diameter yet contains both a food

channel and a salivary channel. These stylets are enclosed within a protective sheath (the labium) that shortens or retracts during feeding.

The Heteroptera include a diverse assemblage of insects that have become adapted to a broad range of habitats -- terrestrial, aquatic and semi-aquatic. Terrestrial species are often associated with plants. They feed in vascular tissues or on the nutrients stored within seeds. Other species live as scavengers in the soil or underground in caves or ant nests. Still others are predators on a variety of small arthropods. A few species even feed on the blood of vertebrates. Bed bugs, and other members of the family Cimicidae, live exclusively as ectoparasites on birds and mammals (including humans). Aquatic Heteroptera can be found on the surface of both fresh and salt water, near shorelines, or beneath the water surface in nearly all freshwater habitats. With only a few exceptions, these insects are predators of other aquatic organisms.

Distribution:

Abundant worldwide. Found in most terrestrial and freshwater habitats.

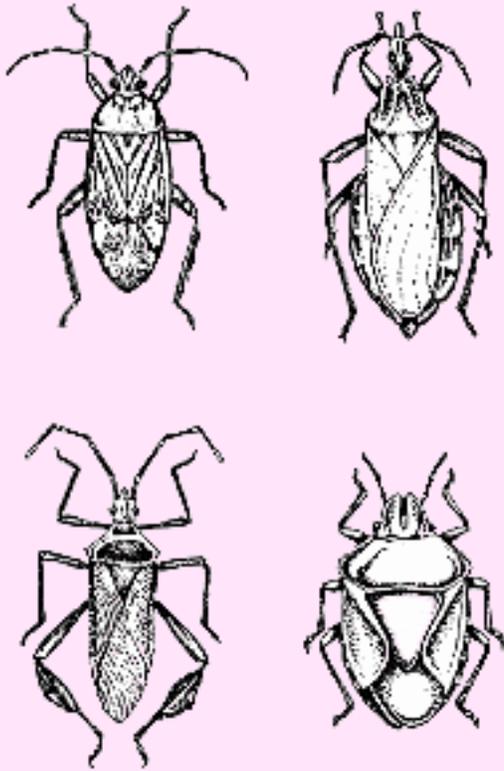
	North America	Worldwide
Number of Families	40	73
Number of Species	3587	>50,000

Classification:

Hemimetabola
incomplete development (egg, nymph, adult)

Hemipteroid
closely related to Thysanoptera and Psocoptera

Physical Features:



Adults:

1. Antennae slender with 4-5 segments
2. Proboscis 3-4 segmented, arising from front of head and curving below body when not in use
3. Pronotum usually large, trapezoidal or rounded
4. Triangular scutellum present behind pronotum
5. Front wings with basal half leathery and apical half membranous (hemelytra). Wings lie flat on the back at rest, forming an "X".
6. Tarsi 2- or 3-segmented

Immatures:

1. Structurally similar to adults
2. Always lacking wings

Economic Importance:

Plant feeding bugs are important pests of many crop plants. They may cause localized injury to plant tissues, they may weaken plants by removing sap, and they may also transmit plant pathogens. Predatory species of Heteroptera are generally regarded as beneficial insects, but those that feed on blood may transmit human diseases. Chagas disease, for example, is transmitted to humans by conenose bugs (genus *Triatoma*, family Reduviidae). Although bed bugs (family Cimicidae) can inflict annoying bites, there is little evidence that they regularly transmit any human or animal pathogen.

Major Families:

The three largest families of Heteroptera are:

- **Miridae** (Plant Bugs) -- Most species feed on plants, but some are predaceous. This family includes numerous pests such as the tarnished plant bug (*Lygus lineolaris*).
- **Lygaeidae** (Seed Bugs) -- Most species are seed feeders, a few are predatory. This family includes the chinch bug, *Blissus leucopterus* a pest of small grains, and the bigeyed bug, *Geocoris bullatis*, a beneficial predator.
- **Pentatomidae** (Stink Bugs) -- Shield-shaped body with large, triangular scutellum. Most species are herbivores, some are predators. All have scent glands which can produce an unpleasant odor.

Other families of terrestrial herbivores include:

- **Tingidae** (lace bugs)
- **Coreidae** (squash bugs and leafooted bugs)
- **Alydidae** (broadheaded bugs)
- **Rhopalidae** (scentless plant bugs)
- **Berytidae** (stilt bugs).

Other families of terrestrial predators include:

- **Reduviidae** (assassin bugs)
- **Phymatidae** (ambush bugs)
- **Nabidae** (damsel bugs)
- **Anthocoridae** (minute pirate bugs).

The major families of aquatic predators include:

- **Corixidae** (water boatmen)
- **Gerridae** (water striders)
- **Nepidae** (water scorpions)

- **Belostomatidae** (giant water bugs)
- **Naucoridae** (creeping water bugs).

Fact File:

- Two families of Heteroptera are ectoparasites. The Cimicidae (bed bugs) live on birds and mammals (including humans). The Polytentidae (bat bugs) live on bats.
- Water striders in the genus *Halobates* (family Gerridae) are the only insects that are truly marine. They live on the surface of the Pacific Ocean.
- Unlike other insects, male bedbugs do not place their sperm directly in the female's reproductive tract. Instead, they puncture her abdomen and inject the sperm into her body cavity. The sperm swim to the ovaries where they fertilize the eggs. This unusual type of reproductive behavior is appropriately known as "traumatic insemination".
- Some members of the family Largidae resemble ants. They live as social parasites in ant nests, mimicking the ants' behavior to get food.

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