

#### **4.ORDER Hemiptera: True bugs, hoppers, and whiteflies**

##### **Heteroptera: True Bugs**

**Etymology:** Heteroptera, derived from the Greek “hetero-” meaning different and “ptera” meaning wings, refers to the texture difference of the front wings which is leathery near the base and membranous at the apex called hemelytra.

Hemimetabola - incomplete metamorphosis

The Heteroptera include a diverse assemblage of insects that have become adapted to a broad range of habitats — terrestrial, aquatic and semi-aquatic.

##### **Key Characters:**

- Mouthparts form tubular proboscis (beak) at front of head
- Front wings (hemelytra) cross over to form “X”-pattern on back
- Triangular scutellum in centre of back
- Front wings leathery at base and membranous toward apex

##### **Economic Importance:**

- Plant feeding bugs are important pests of many crop plants.
- Predatory species are beneficial insects
- Chagas disease is transmitted to humans by *Triatoma*, an assassin bug.
- Bed bugs are urban pests

##### **Major Families:**

Miridae (Plant Bugs) — Most species feed on plants, but some are predaceous. This family includes numerous pests such as the green plant bug (*Creontiades dilutus*) but also predators like the green mirid bug, *Cyrtorhinus lividipennis*.



**Lygaeidae (Seed Bugs)** — Most species are seed feeders, a few are predatory. This family includes the chinch bug, *Oxycarenus laetus*, a pest of cotton, Dorth Maul bug *Spilostethus hospes* and the big-eyed bug, *Geocoris bullatis*, a beneficial predator.



Big eyed bug



Darth Maul bug

**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 odour. One group of stink bugs called spiny soldier bugs are insect predators



Painted Stink bug



Man Faced stink bug



Predatory stink bug

**Tingidae (lace bugs)**



**Rhopalidae (scentless plant bugs)**

**Coreidae (squash bugs and leaf-footed bugs)**



**Berytidae (stilt bugs)**

**Alydidae (broad-headed bugs)**





## Terrestrial predators

**Reduviidae** (assassin bugs  
and ambush bugs)









**Nabidae** (damsel bugs)



**Anthocoridae** (minute  
pirate bugs)



The major families of aquatic predators include:

<b>Corixidae</b> (water boatmen) 	<b>Gerridae</b> (water striders) 	<b>Nepidae</b> (water scorpions) 
<b>Belostomatidae</b> (giant water bugs) 	<b>Naucoridae</b> (creeping water bugs) 	<b>Notonectidae</b> (backswimmers) 



- Two families of Heteroptera are ectoparasites - **bed bugs and bat bugs**.
- Water striders in the genus *Halobates* are the only insects that are **truly marine** and live on the surface of the Pacific Ocean.
- Some members of the family Largidae resemble ants. They live as social parasites in ant nests, mimicking the ants' behaviour to get food.

### **SUB ORDER - HOMOPTERA: Leafhoppers, planthoppers, treehoppers, cicadas, aphids, psyllids, whiteflies, and scale insects**

**Etymology:** Homoptera, derived from the Greek “homo-” meaning uniform and “ptera” meaning wings, refers to the uniform texture of the front wings.

Hemimetabola or incomplete metamorphosis

#### **Key Characters:**

- Short proboscis emerges near back of head
- Wings held tent-like over abdomen
- Many with bristle-like antennae and a wedge-shaped head
- 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 three or 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 specialised.
- In most of the Homoptera, a portion of the digestive system is modified into a filter chamber to ingest and process large volumes of plant sap.
- Excess water, sugars, and certain amino acids are excreted as honeydew.

#### **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 coloured.



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.



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Aphididae (Aphids, Plantlice) — Second largest family in the suborder Homoptera. Many of these insects are pests of cultivated plants and vectors of viral plant diseases.



Coccidae (Soft Scale insects) — Most species are sedentary during most of their life cycle and secrete a protective covering over their bodies.



## Trivia

- *Laccifer lacca*, a scale insect, is the source of natural shellac.
- *Dactylopius coccus*, the cochineal insect lives on prickly pear cacti and is the source of a bright red dye.
- Aphids in the subfamily Pemphiginae are gall-makers.
- Honeydew, excreted by many homopterans is a source of food for other animals. **Honeydew from a mealybug, *Trabutina mannipara***, is regarded as the probable source of **Biblical manna**.  
Source: <https://www.inaturalist.org/taxa/60937-Trabutina-mannipara>
- The ground pearls are a group of scale insects belonging to family Margarodidae and live on plant roots. In some tropical species, the females form large wax cysts, often bronze or gold in colour.