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رتبة (مستقيمة الاجنحة ونصفية الاجنحة)	عنوان المحاضرة باللغة العربية
Order(Orthoptera & Hemiptera)	عنوان المحاضرة باللغة الإنكليزية
4	رقم المحاضرة

Order: Orthoptera (Gr., ortho= straight; ptera =wing) common name Grasshoppers, Locusts, Cricket

The orthopterans are typically terrestrial and can be easily found in grasses, bushes, other vegetation and above ground. A few species are aquatic or semi-aqua . More than 20,000 species have been described till date.

Characteristic Features

- a) They are small to large-sized insects well developed eyes and filiform antennae.
- b) They may be winged, brachypterous or apterous. forewings are small, thickened and leathery forming tegmin, while hindwings are membranous and are folded like pleats beneath the tegmina.
- c) Hind legs are large, modified for jumping
- d) Specialized stridulatory (sound-producing) and auditory (hearing) organs are developed.
- e) Abdomen is 11-segmented with have large, well developed ovipositor.

Life

Cycle

Orthopterans develop by incomplete metamorphosis. The majority of orthopterans lay their eggs in the ground or on vegetation. The eggs hatch and the young nymphs resemble adults but lack wings and at this stage are often called hoppers. Through successive moults the nymphs develop wings buds until their final moult into a mature adult with fully developed wings.

Orthoptera include two sub-order :

1- **Ensifera** Antennae usually long, with more than 30 segments; auditory organs, if present, consist of tympanum; many species with stridulatory mechanism at base of tegmen; ovipositor usually present as rounded or flattened, or elongated cylindrical spearlike, structure.

Superfamily Grylloidea Family Gryllidae (crickets)



2- **Suborder Caelifera**

Antennae short, with less than 30 segments, ovipositor usually consists of paired valvular appendages adapted for digging.

Superfamily Tridactyloidea Family Cyllindrachaetidae



Grasshoppers

Order: Hemiptera (Gr., hemi= one-half; ptera = wing); Common name: True bugs, Scale insects, Aphids, White flies Hemiptera is the largest exopterygote order. Most hemipterans are phytophagous, sucking plant sap. A few species feed on small insects and are predatory, while some are parasitic on vertebrates and may transmit diseases. There are about 80,000 species recognized till date.

Characteristic Features

- a) Hemipterans are small to large-sized insects (1 – 110 mm long).
- b) They usually have two pairs of wings. Forewings are of harder consistency than hindwings.
- c) Adult true bugs have a triangle structure, scutellum between their wings.
- d) Opisthognathous ,piercing and sucking mouthparts.
- e) Hemipterans exhibit various modes of locomotion, such as swimming, skating on a water surface, jumping, walking and flying.

Adult heteropterans are easily recognised. The forewings have a unique structure in that most of the forewing is thickened and usually coloured, while the tip is membranous and often colourless. This feature gave the name Hemiptera (half-wing) to the order as a whole.



Suborder Hydrocorisae (or Cryptocerata)

Antennae 4-segmented, shorter than head, usually in grooves on underside of head; semiaquatic (Gelastocoridae, Ochteridae) or aquatic (all other families) swimming members on hind legs.

water boatman, (family Corixidae)

- More than 300 species of insects in the true bug order
- that are named for their flat, boat-shaped bodies and long, fringed, oarlike hindlegs.
- The water boatman is lighter than water and generally attaches itself to vegetation at the bottom of a pond or stream and breathes from an envelope of air stored around its body and under its wings.
- When feeding, it scoops up algae and other small organisms
- Eggs are usually deposited on underwater vegetation.
- The water boatman does not bite people.



backswimmer, (family Notonectidae)

- Are named for their ability to swim on their backs
- Are shaped like the keel and sides of a boat.
- The backswimmer uses its long oarlike legs for propulsion and has an oval-shaped head and an elongated body



water scorpion (family Nepidae)

The water scorpion resembles a land scorpion in certain ways: it has scythelike front legs adapted for seizing prey and a long, . The bite of the water scorpion is painful but is far less harmful to humans than the sting of the true scorpion.



Family Belostomatidae (giant water bugs and toe biters)

Large, some species exceeding 109 millimetres (4 inches) in length; broad, flattened body; inhabits fresh water; may lie in mud or debris on bottom; can inflict severe bites; predatory



Giant water bug (*Lethocerus*).

Suborder:Gymnocerata

Including mostterrestrial bugs , Antennae longer than the head,antennae are present (are not hidden in grooves).

(family Pentatomidae)

are named for the foul-smelling secretions they produce. These odours may be transferred to the resting place of the insect such as plants, fruits, or leaves, giving them a disagreeable or nauseating taste.

Their colour brown, green, or metallic

Stinkbugs may feed on plants, causing discoloration or spotting of the fruit, or they may prey on other insects. One of the most important plant pests is the harlequin cabbage bug (*Murgantia histrionica*). The southern green stinkbug, or green vegetable bug (*Nezara viridula*)



Family :Lygaeidae

The family is sometimes called the chinch bug family because one species, the destructive chinch bug , feeds on the sap of plants. Other important members of the family include the Old World, or Egyptian, cotton stainer (*Oxycarenus hyalinipennis*), is destructive to fruit trees, and the predatory *Geocoris punctipes*, which feeds on mites, termites, and other small plant-feeding insects.



Family: Reduviidae assassin bug

An assassin bug uses its short three-segmented beak to pierce its prey and then suck the body fluids from its victims. Although assassin bugs are generally black or dark brown, some species are brightly coloured. Most members of the family live outdoors and prey on other insects. However, some suck blood from vertebrates, including humans, and transmit diseases.

Some of the best-known assassin bugs are the members of subfamily Triatominae, commonly known as triatomine bugs or kissing bugs. Some species of triatomine bugs—particularly members of the genera *Panstrongylus*, *Rhodnius*, and *Triatoma*—are carriers of the protozoan parasite *Trypanosoma cruzi*, which causes Chagas disease.



damsel bug, (family Nabidae)

Each foreleg of the damsel bug is slightly thickened and has a double row of spines that act as grasping organs when the leg bends. *Nabis* is one of the most common genera in this family, which contains about 300 species throughout the world.



bedbug, (**family Cimicidae**), any of about 75 species of insects in the true bug , that feed on the blood of humans. The reddish brown adult is broad and flat and 4 to 5 mm long. The scalelike vestigial wings are nonfunctioning. The distinctive oily odour of bedbugs

results from a secretion of the or stink, glands. Each female lays an average of 200 or more eggs during a single reproductive period, and three or more generations may be

Kingdom: Animalia

Phylum: Arthropoda

Subphylum: Hexapoda

Class: Insect

Order: Hemipter

Family: Cimicidae

Genus: Cimex

Species: lectularius

