- **Family : Gryllotalpidae (mole crickets)**

1. They are brown coloured insects found inside burrows.
2. Eyes are reduced.
3. Pronotum is elongate, ovate and rounded posteriorly.
4. Forelegs are fossorial. Tibiae are expanded and digitate.
5. Hindwings are extended beyond the tegima as a pair of processes
6. Special stridilatory structures are absent. A humming sound is produced by rubbing the forewings.
7. Ovipositor is vestigial.
8. Mole crickets burrow into the soil and feed on tender roots of growing plants. Gryllotalpa

Order: Dictyoptera: (cockroaches and mantids)

- **Suborder: Blattodea**

- The body is flattened oval.
- The head is under the pronotum.
- All legs for walking or running

- **Suborder: Mantodea**

✓ Body elongate, prothorax long and slim

✓ Head free,

✓ Front legs fitted for catching insects prey (Grasping legs)

Order Phasmida: (Walking sticks)

elongate bodies. wingless however, some tropical forms are winged and are called leaf insects. They have extremely elongate and stick-like bodies with long legs and long antennae. These insects have chewing mouthparts.

Order Isoptera: (Termites):

1. Pale, elongate bodies, and are sometimes called "white ants."
2. Reproductive individuals have two pairs of membranous wings, all of equal length.
3. Termites shed their wings after mating.
4. Have chewing mouthparts.
5. Antennae are roughly the length of their heads.

Order Dermaptera : (Earwig**)**

1. Flattened elongated body
2. Heavily sclerotised pincer-like cerci. Females have straight cerci with a inward pointing tip and males have curved cerci
3. 2 pairs of wings. The forewings are short and protectively hardened. The hind wings are membranous and folded in a fan-like way underneath the forewings when not in use. Some species are also wingless
4. Chewing (mandibulate) mouthparts
5. Moderately long antennae

Order: Embioptera

- Elongated, cylindrical body
- Enlarged front tarsi which contains silk glands used to create the galleries they live in
- Short legs
- 2 pairs of membranous wings in some male species. All females are wingless
- 2 short cerci, which in male web-spinners are unequal in size and shape

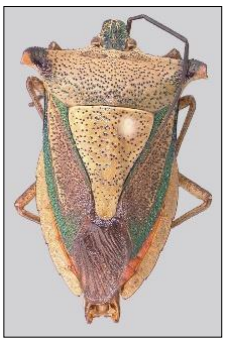
❖ Hemipteroid Orders:

➢ **Order Hemiptera: (**True Bugs**) (Cicadas, Hoppers, Aphids, Whiteflies, and Scales insects)**

1. Basal portion of the front wing is thickened and leathery
2. Apical portion is membranous (this type of wing is called hemelytron, or hemelytran if single)
3. Hind wings are completely membranous and shorter than the front wings
4. Wings at rest are held over the abdomen with membranous tips overlapping
5. Some are wingless
6. piercing-sucking mouth parts
7. Antennae are fairly long and contain four to five segments
8. Compound eyes are usually well developed
9. Many have glands secreting unpleasant odor
10. Most species are terrestrial but some are aquatic
11. Predacious ones are beneficial to man
12. Some may serve as disease vectors

➢ **Family: Pentatomidae (Stink bugs)**

1. Antenna is five segmented.
2. Scutellum is prominent and shield like.
3. Adults and nymphs produce a disagreeable odour from stink glands located in metathorax and abdomen respectively.
4. Some are phytophagous and some are predaceous. e.g. Green stink bug *Nezara viridula* is a pest on millets.



- **Family: Cimicidae (Bed bugs)**

1. Body is dorsoventrally flattened so that they can hide in cracks and crevices. Body is oval in outline.
2. It is dull reddish brown incolour.
3. Thorax is deeply notched in front to receive the short head upto bulging eyes.
4. Hemelytra very short and reduced to scale like pads.
5. Hindwings are completely atrophied.
6. Stink glands are located in the dorsal surface of first three abdominal segments.
7. Male bed bugs pierce the integument of the female and inject the sperm into the haemocoel during copulation (Haemocoelic or traumatic insemination).
8. Beg bugs hide in crevices of beds, furniture, etc., during theday and emerge at night to seek a blood meal.They are blood sucking ectoparasites on birds and mammals. They are known for their irritating bite. Cimex lectularis is important

- **Family: Belostomatidae (Gaint water bugs)**

1. They are large sized insects.
2. Eyes are bead like.
3. Antennae are concealed in ear-like pockets.
4. Forelegs are raptorial and suited for capturing prey.
5. Hind legs are adapted for swimming.
6. tibia and tarsus are flattened and fringed with hairs.
7. Abdomen with two short retractile apical appendages forming a terminal breathing tube.
8. They are positively phototropic. They are excellent fliers and swimmers.

- **Family: Lygaeidae (Seed bugs or Chinch bugs)**

1. Cuneus is absent in hemelytra.
2. Membrane has a few irregular veins (4-5 veins) arising from a transverse basal vein.

- **Family: Reduviiade (Assassin bugs, Kissing bugs)**

1. Head is narrow and elongate, constricted behind the eye forming a neck.
2. Beak is short, three segmented and fits into a groove in the pro-sternum.
3. Abdomen is widened in the middle.
4. Lateral margins of the abdominal segments are exposed beyond the wing

- **Family: Gerridae: (Water striders)**

1. Slender, elongate insects.
2. Forelegs are short, raptrorial and suited for capturing prey.
3. Middle legs are long and useful in pushing.
4. Hindlegs are long and useful in steering. Hind femur is very long and extends beyond the abdomen.
5. Legs are fitted with fine non wetting hairs.
6. They skate on water surface.
7. They feed on insects falling on water surface.