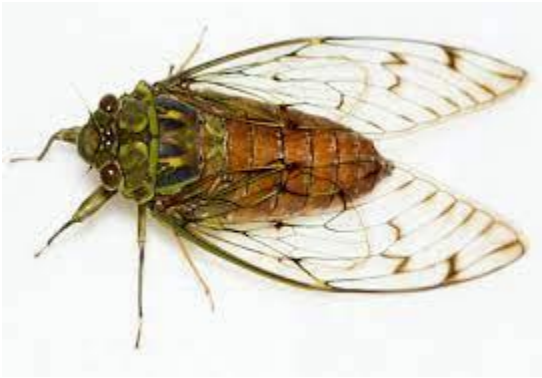
❖ **Order: Homoptera (Cicadas, Hoppers, Aphids, Whiteflies, and Scales insects)**

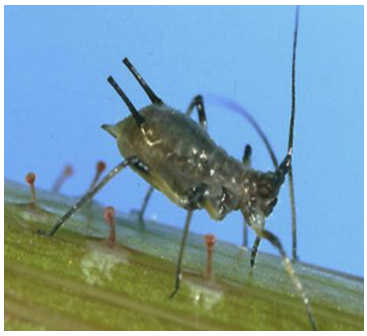
1. Wingless or with one or two pairs of wings.
2. The wings at rest are usually held roof-like over the body, with the inner margins overlapping slightly at the apex.
3. Mouth parts for sucking and opithisognathous in position.

1) Family: Cicadidae (The Cicadas**)**

1. Males have sound producing organs at the base of the abdomen. Sound producing organs consist of a pair of large plates, the opercula covering the cavity containing structures producing sound. A shinning mirror is located in the posterior part of the cavity. In the lateral wall of the cavity is an oval shaped ribbed structure, the tymbal. These are vibrated by strong muscles to produce sound. Each species has a characteristic song. Tympanum is present in both in sexes.
2. Wings are transparent.
3. Eggs are inserted into the tree twigs by the female.
4. Nymphs drop to the ground, enter the soil and feed on root sap.
5. Anterior femora of the nymph is thickened with spines beneath and are suited for digging the soil.
6. Life cycle of periodical cicada lasts for 13-17 years.



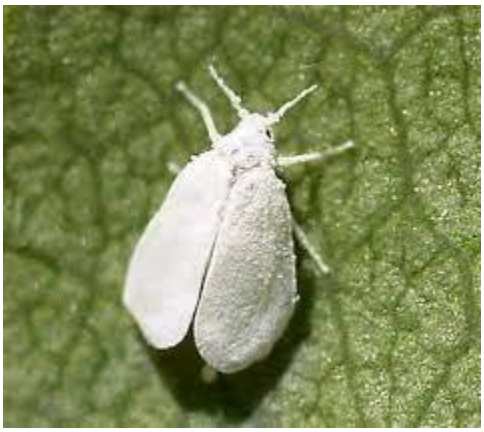
2) Family: Aphididae (Plants lice**)**



1. Body is pear shaped
2. Both apterous and alate forms are found.
3. A pair of cornicles or siphonculi or wax tubes is present in the dorsum of fifth or sixth
4. abdominal segments which secretes wax like substance.
5. They excrete copious amount of honey dew on which ants feed and sooty mould fungus grows.
6. Aphids are known for their extraordinary fecundity, short life cycle and parthenogenitic reproduction. Life cycle is highly complex and it involve alternation of generation.
7. They feed on plant sap and disseminate plant diseases.
8. e.g. Cotton aphid *Aphis gossypii*.

3) Family: Aleyrodidae (Whiteflies)

1. Minute insects which superficially resemble tiny moths.
2. Wings are opaque and dusted with mealy white powdery wax. Wing venation is much reduced.
3. Vasiform orifice is present in the last abdominal tergite. It is a conspicuous opening provided with an operculum. Beneath the operculum there is a tongue-like organ termed lingula. The anus opens at the base of the lingula through which honey dew is excreted in large amount.
4. Immature instars are sessile, scale like, with waxy covering.
5. e.g. Cotton whitefly *Bemisia tabaci* transmits vein clearing disease in bhendi.



❖ **Order Mallophaga (**chewing lice**)**

1. Body flattened, wingless, with poorly-developed, small eyes or eyeless.
2. Chewing mouthparts.
3. Head usually broader than long. Antennae short,
4. Claws well-developed for clinging to the host.
5. All ectoparasitic in both adult and nymphal stages upon birds and sometimes mammals.

Family: Menoponidae (bird lice)

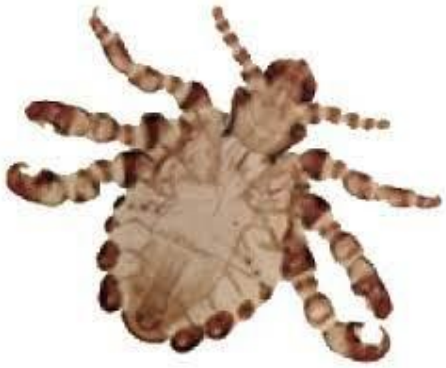
Family**:** Trichodectidae (mammal chewing lice)

Family: Philopteridae (bird lice)

❖ **Order Anoplura (**sucking lice**)**

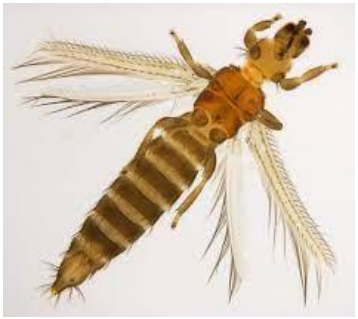
1. they are all very small and do not have wings. With Sucking mouth parts
2. also have short antennae, small heads, and very small eyes.
3. many species do not even have eyes at all! The main feature that all sucking lice share is that they live on mammal hosts and survive by sucking their blood (founds on mammals)

- *Pediculus humanus capitis*: head louse
- *Pediculus humanus humanus*: body louse
- *Pthirus pubis:* pubic louse or crab louse



- **Order: Thysanoptera (Thrips)**

  Thrips are small winged insects ranging in size from 0.5-15 millimetres in length. They are closely related to bugs (Hemiptera) with similar sucking mouthparts but can be distinguished by the following features:



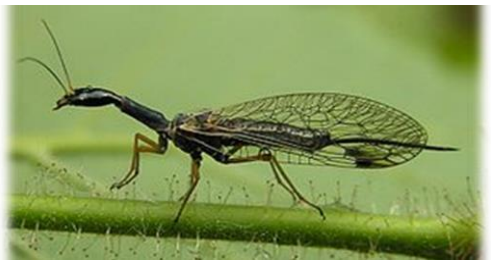
1. Slender, cylindrical, elongate body
2. Sucking and rasping mouthparts
3. 2 pairs of slender membranous wings that are fringed with long hairs. (Hairy wing) Some species are wingless
4. Legs that end in a bladder-like organs not a typical tarsal claw

II) Division: Endopterygota

This division characterized as following:

- Wings develop internally.
- Metamorphosis complete. (Holometabola)
- Immature stages are larvae which are completely different from adults in both structures and habits.
- Life cycle associated with a pupal instar.

Order: Neuroptera (Snakeflies, Lacewings, Antlions)



1. They are soft bodied insects.
2. Antenna is filiform, with or without a terminal club.
3. Mouthparts are chewing type in adults.
4. Wings are equal, membranous with many cross veins.
5. They are held in a roof-like manner over the abdomen.
6. They are weak fliers
7. Larva is campodeiform with mandibulosuctorial mouthparts.
8. Pupa is exarate. Pupation takes place in a silken cocoon.

- **Family: Chrysopidae (Green lacewings, Aphid lions)**

1. Body is pale green in colour.
2. Eyes are golden yellow in colour.
3. Eggs are mounted on stalks to avoid predation and cannibalism.
4. Larvae preys on soft bodied insects, especially on aphids.
5. They are mass multiplied and released in fields for controlling aphids.

- **Family: Myrmeleontid (Antlions)**

1. Adult resembles a damselfly.
2. The antenna is long a clubbed.
3. They are weak fliers.
4. Grubs construct conical pits for capturing prey.
5. Larval mandibles are sickle-like with one or more internal teeth
6. They have dolichasters (Lateral segmental processes fringed with setae).

- **Family: Ascalaphidae (Owlflies)**

1. Adult resembles a dragonfly.
2. Antenna is long, conspicuous and clubbed
3. Hypostigmal cell is present in the wings
4. Larvae do not construct pits to capture the prey
5. Adults are aerial predators like dragonflies.