

Order: Thysanoptera

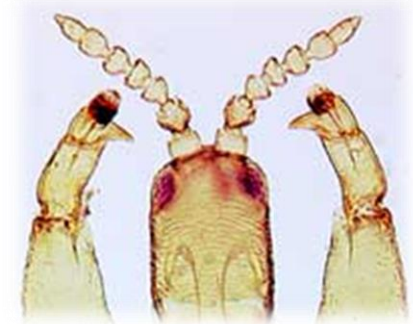
Thysano: Fringed and pteron: wing



thrips
(Thysanoptera)

Eg. Thrips (fringed wings)

1. Small to minute slender bodied terrestrial insects
2. Antennae short moniliform, 6-10 segmented, usually with **sense cones or sensoria** on 3rd or 4th segments
3. Compound eyes conspicuous with 3 ocelli in winged forms



4. Mouth parts **asymmetrical, right mandible is rudimentary, lacerating and sucking or rasping and sucking type with three stylets**

Mouth cone is formed by the labrum, labium and the maxillae which extend ventrally between the front coxae

5. Winged or wingless, wings when fully developed are long and narrow with highly reduced venation (with few no veins). They **fringed** with long hairs on the margins



6. Legs short, tarsi 1 or 2 segmented with 1 or 2 claws, with a bladder like terminal protrusible vesicle (hence known as **Physopods** previously)

which at rest is retracted and invisible When walking, it is exerted out by means of blood pressure and enable the insect to walk on any kind of surface



7. Abdomen is elongate with 10-11 segments, usually tapering posteriorly

8. Cerci absent

9. Metamorphosis is accompanied by one or two inactive pupal instars i.e intermediary between simple and complete.

10. Parthenogenetic type of reproduction is very common and in many species males are rarely seen

Family.

Thripidae

1. This is the largest and most important injurious family in thrips.

2. Antennae 6-9 segments not conical with sense cones on 3rd or 4th

Antennae ends in 1 or segmented apical style. 4th segment usually enlarged

3. Winged / wingless. If winged, the wings are narrow and pointed at the tip and fringed with long hairs on the margins

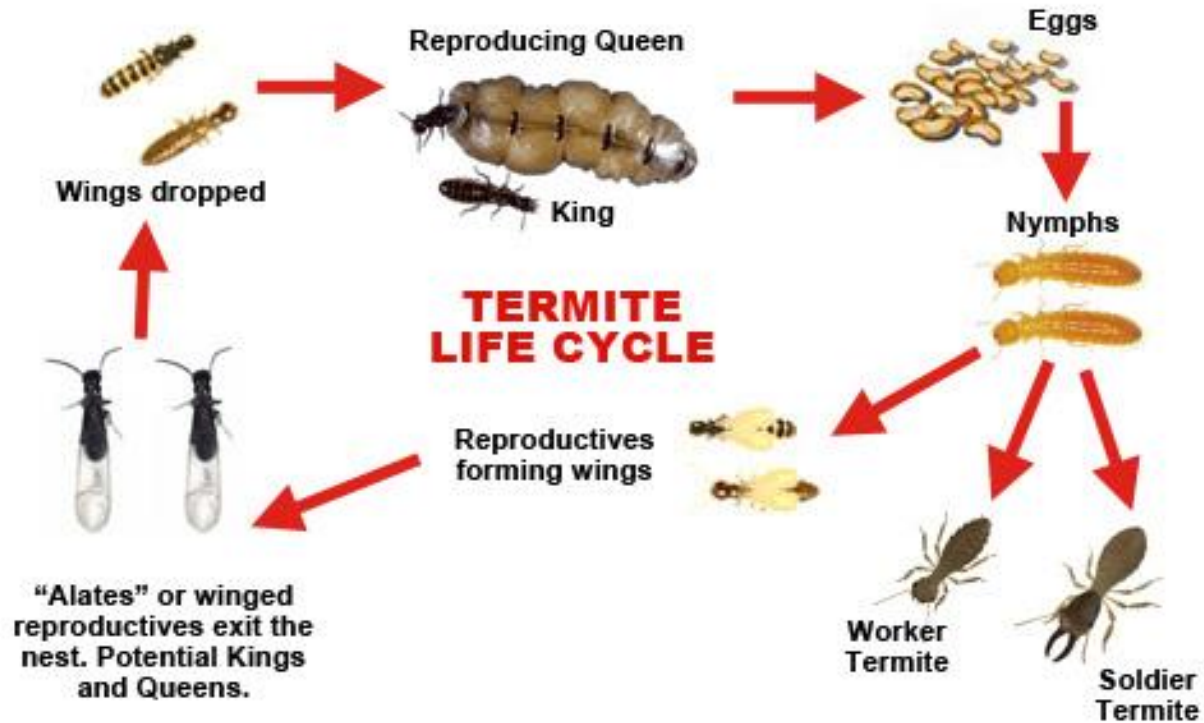
4. Ovipositor normally well developed and down curved

5. Tarsi sometimes with claw like appendages at apex of 1st or 2nd segment

Eg: **Onion thrips -Thrips tabaci** **Chilli thrips - Scirtothrips dorsalis**

Order Isoptera

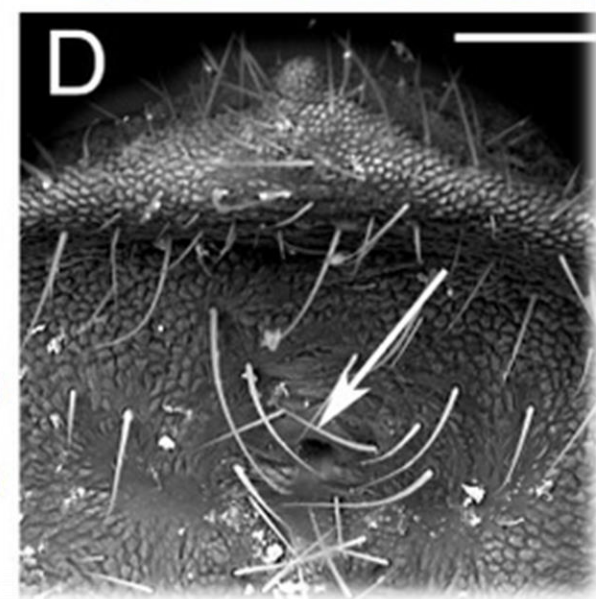
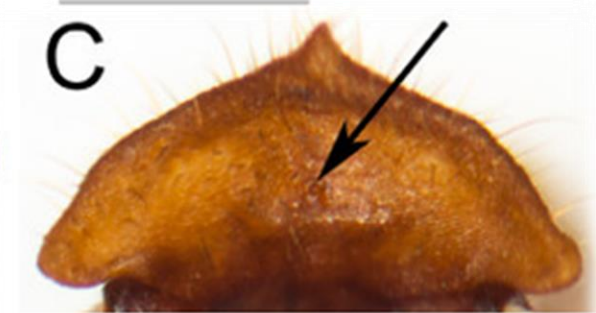
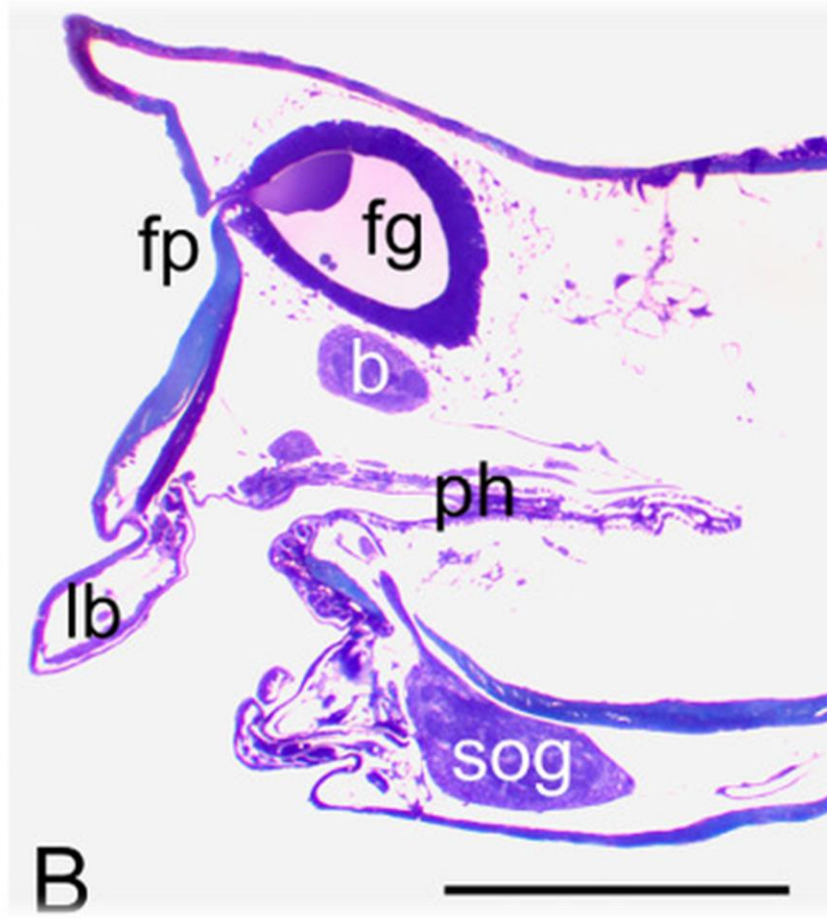
Order: Isoptera Iso – Similar; Pteron – wings;



Termites or white ants

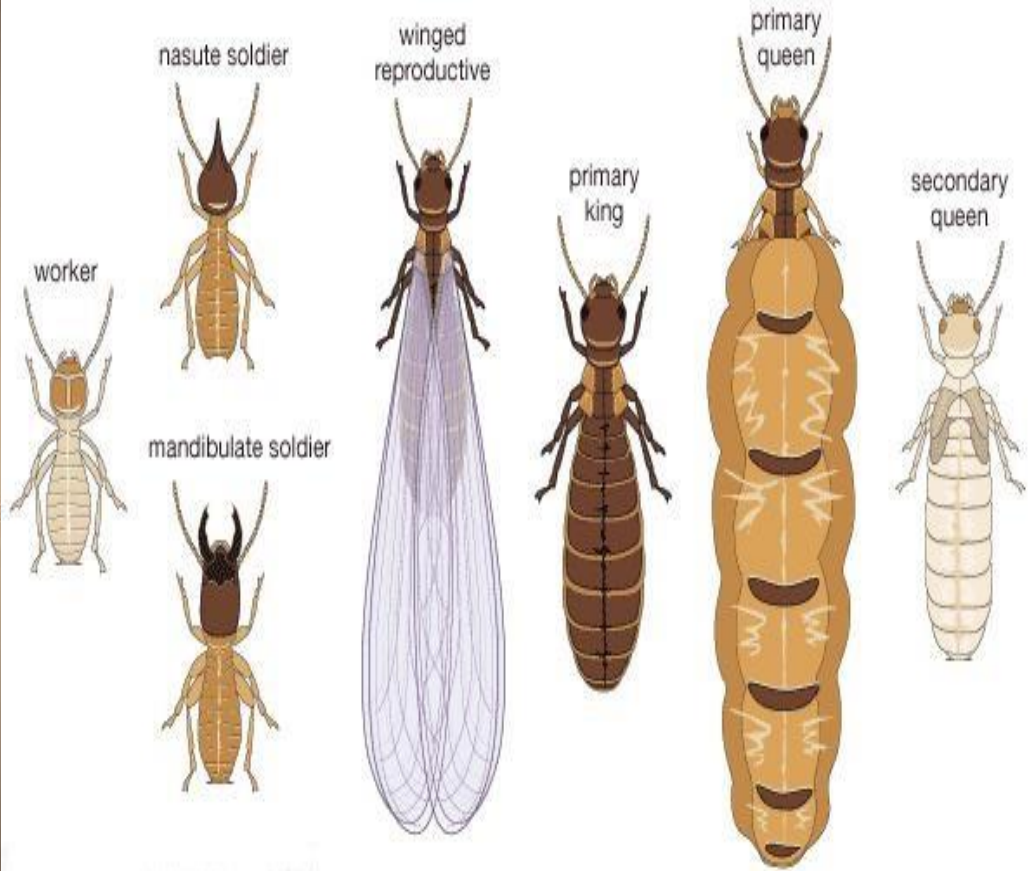
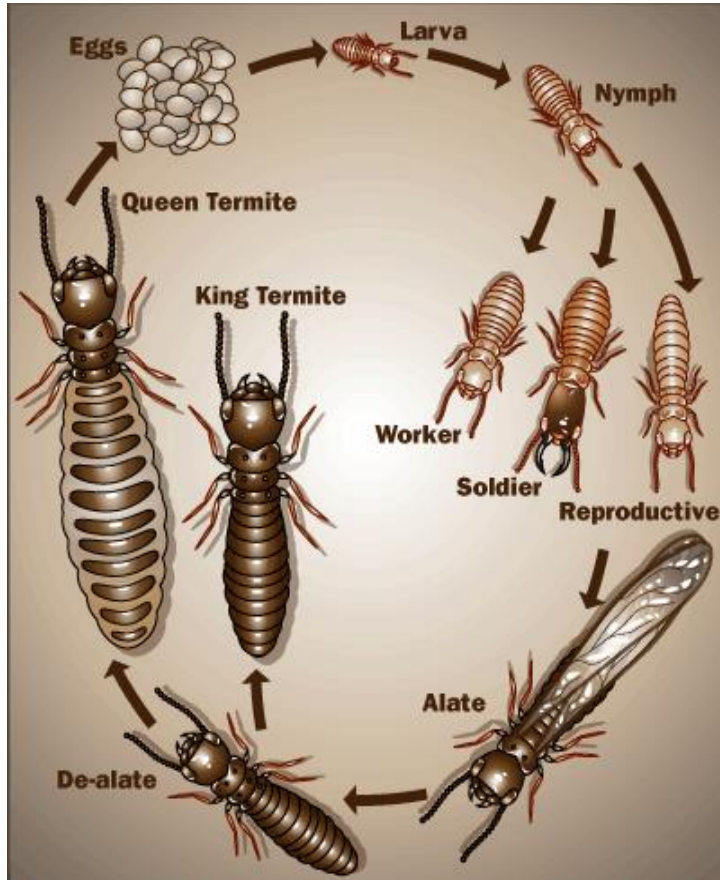
- **social living** and **polymorphic** insects with well developed **caste system**
- Antennae are **moniliform** (some times filiform also)
- Compound eyes present in winged forms, median ocellus wanting
- Mouth parts typical biting type with powerful mandibles
- **Apterous, brachypterous or winged**. In winged forms, the front and hind wings are similar
- When at rest the wings are held flat over the body and extend beyond the tip of abdomen.
- Wings are membranous with reduced venation and are shed by means of **basal structures after Nuptial flight**
- Legs short and stout. Tarsus usually 4 segmented
- **Frontal gland** is a characteristic termite organ which attains its greatest Development in soldiers.
 - It is formed by a group of hypodermal cells in the median line of frons
 - Sac like gland communicates to the exterior by frontal pore opens in a shallow depression, known as **frontanella** and is defensive functions
- Anal cerci short or very short
- Metamorphosis simple or incomplete

Frontal gland in Termite soldier



Caste system:

Following are the difference castes that are usually seen in a termite colony



Reproductives or Primary reproductives: (King& Queen)

- highly developed individuals sexually
- fully developed wings and compound eyes and are usually heavily pigmented
- The males are often small and Queens sometimes live for several years
- The kings and queens are usually produced in large numbers at certain seasons
- They leave the colony in a swarm, mate and individual pairs establish new colonies
- wings are shed after mating leaving remnants called stubs after **nuptial flight**
- The queen termite attains enormous size after mating known as **physogastry**



Supplementary reproductive:

- They have short wings and less heavily pigmented, usually have smaller eyes
- They sometimes carry on extensive reproduction in the colony and supplement the queen in building the colony
- 3 types **Adultoid**- resembles primary ones but small in size, **Nymphoid**- with short pad like wings and **Ergotoid** Types- no wing rudiments and appears like nymph

Workers:

- These are **sterile**, pale in colored **wingless** adults and lack compound eyes
- Mandibles are small and to collect food and feed queens, soldiers and newly hatched young ones
- They form the bulk of the colony and build up nests, passage ways, tunnels and galleries



Soldiers:

- These are also sterile **wingless adults** with greatly enlarged head and mandibles
- Slightly larger than workers, may or may not have compound eyes
- They protect the colony

- Three types of soldiers may be seen
- (1) **Mandibulate** type- head with large and strong mandibles for defense
- (2) **Nasute type** (Nasuti)- head prolonged anteriorly into a narrow snout through which a sticky secretion is exuded from frontonella and Mandibles are reduced
- (3) **Phragmatoid** type- Broad plug like head to used to block the nest entrance



Food and Feeding:

- The food of termites is the cast skins and secretions of other individuals, dead individuals and plant materials such as wood and wood products
- Termites frequently groom each other with their mouth parts as a result of the attraction of some secretions available on the body

Trophallaxis – Mutual exchange of food between individuals i.e secretions of the body

- Different types of feeding are:
- **Exogenous**-wood, fungus, grass Humus
- **Endogenous**- nymphs and soldiers feed on mixture of salivary and intestinal secretions of workers
- **Proctodeal**- This feeding distributes the **protozoan** fauna among the members to digest **cellulose**
- **Foraging**: Groups of Termites includes workers and soldiers form a procession and search for food outside the nest.
- They collect the food material like grass and other decaying leaves and bring to the nest during day times

- **Family: Termitidae**
- Included about 2/3rd of recent isopterans
- **Frontanella** present
- Pronotum of workers is narrow with a raised anterior lobe, saddle shaped
- The scale or stub of the front wing is shorter than pronotum
- Wing margin is more or less hairy and **RS Reduced / absent**
- Cerci with 1 or 2 semented
- These are all ground dwelling with wide range of food habits
- **Eg: Odontotermes obesus and Microtermes obesi**