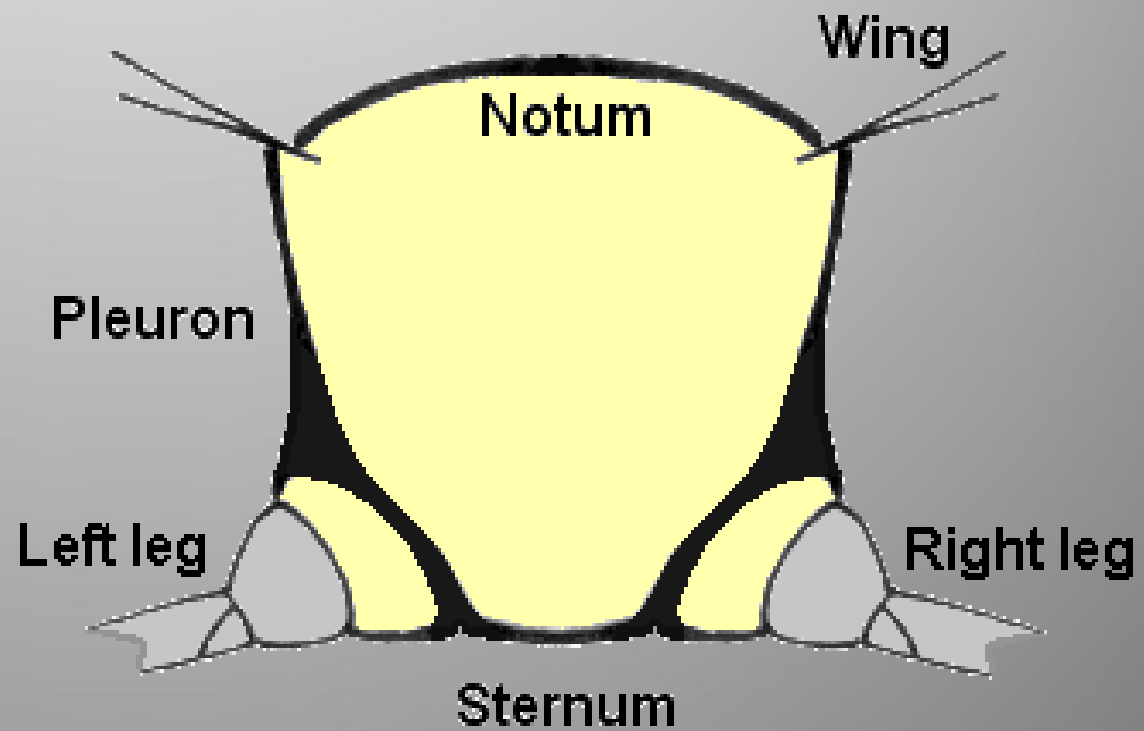
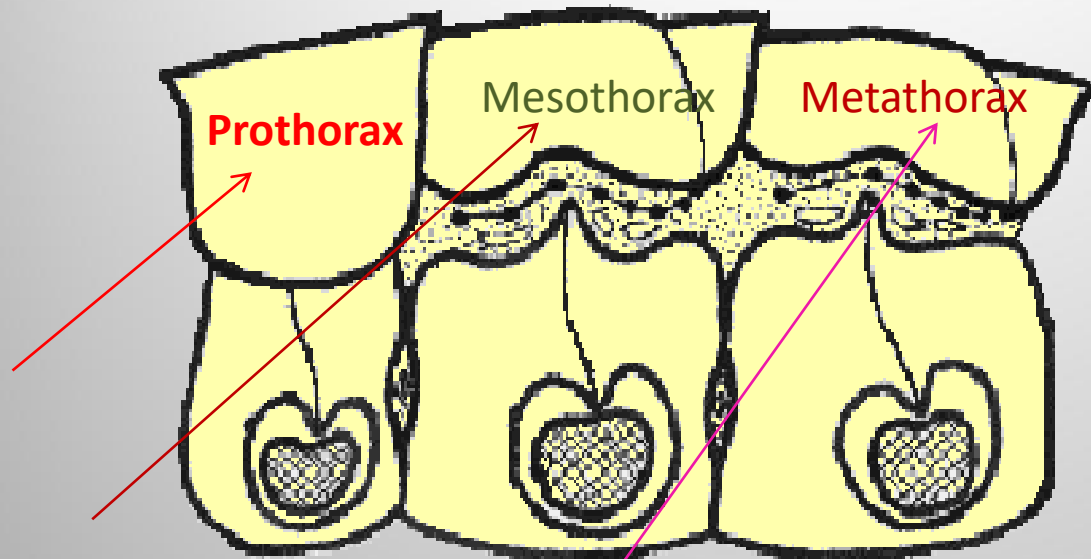


Lab 6

Thorax

The second region of an insect's body. It contains three pairs of walking legs and in many adult insects, one or two pairs of wings.

- The insect thorax is divided into three parts: the prothorax (pro=first), mesothorax (meso=middle), and metathorax (meta=last).
- Each segment consists of hardened plates, or sclerites. Dorsal sclerites are called nota or (tergum) (singular notum), lateral sclerites are called pleura (singular pleuron), and ventral sclerites are called sterna (singular sternum).
- The first segment of the prothorax is the [pronotum](#).
- Each of the three thoracic segments contains one pair of [legs](#). [Wings](#) are found only on the meso - and metathoracic segments.



Pronotum

The pronotum is the dorsal sclerite of the prothorax, which can be highly modified in various orders such as the Hemiptera, Blattaria, and Coleoptera.



Treehoppers (order Hemiptera)

Pronotum

Scarab beetles (order Coleoptera) and other beetles may also have unusual pronotums. In addition, the specimens shown here also have bizarre modifications of the head capsule. Male insects use horns to fight with other males over females and territory.



Hercules beetle



Dung beetle



***Chalcosoma caucasus*, male**

Pronotum:-

Cockroaches (order Blattaria) have pronotums that extend forward over the head.



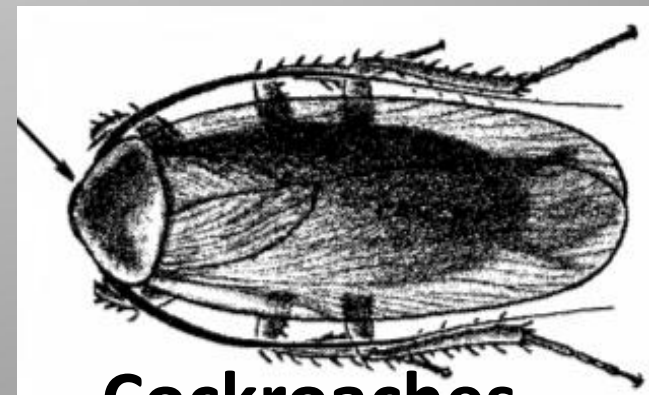
Madagascar hissing cockroach



German cockroach



Orange-headed cockroach



Cockroaches

Thoracic appendages

1. Legs

Legs

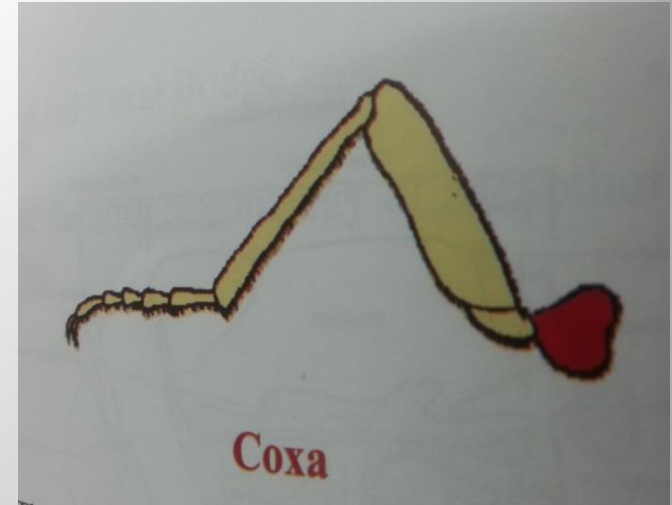
First appendage of thorax most insects have three pairs of walking legs one pair on each thoracic segment. Each leg contains five structural segments that articulate with one another.

- * The **fore-legs** are located on the prothorax, the **mid-legs** on the mesothorax, and **the hind legs** on the metathorax.
- * Each leg has six major components, listed here from proximal to distal: **coxa** (plural coxae), **trochanter**, **femur** (plural femora), **tibia** (plural tibiae), **tarsus** (plural tarsi), **pretarsus**.

Morphology of legs

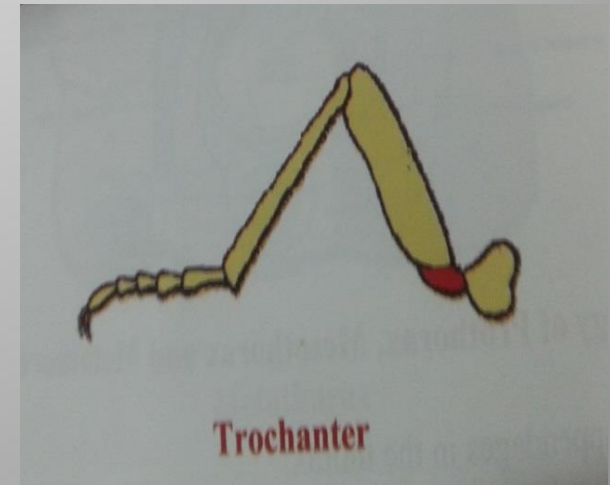
- 1- coxa:-

The first segment of leg connect between coxa process and trochanter, have differ size and shape with different group of insect.



- 2- Trochanter:-

The second segment of leg connects Femur and coxa, have different size And shape with different group of insect.

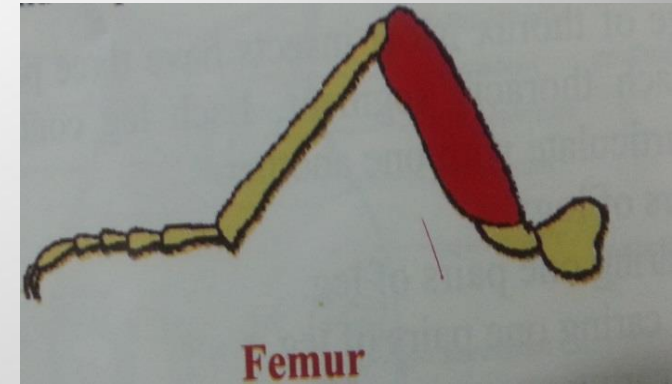


Morphology of legs

- 3- Femur:-

The 3rd segment of leg connect between trochanter and tibia,

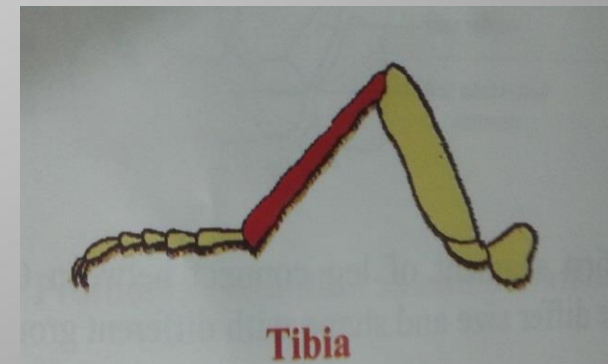
have differ size and shape with different group of insect.



- 4- Tibia:-

The 4th segment of leg connects femur and tarsus, have different size

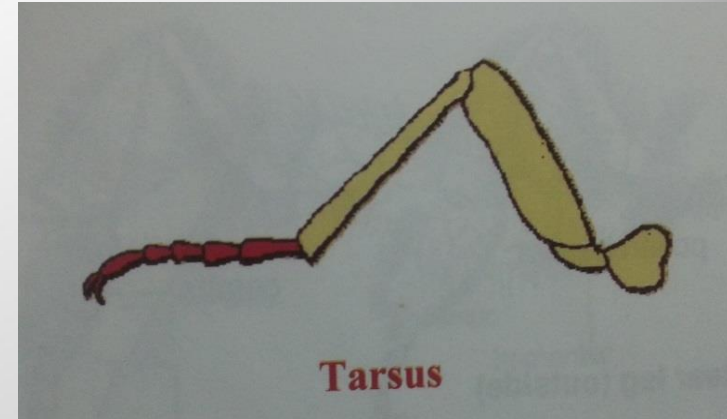
and shape with different group of insect.



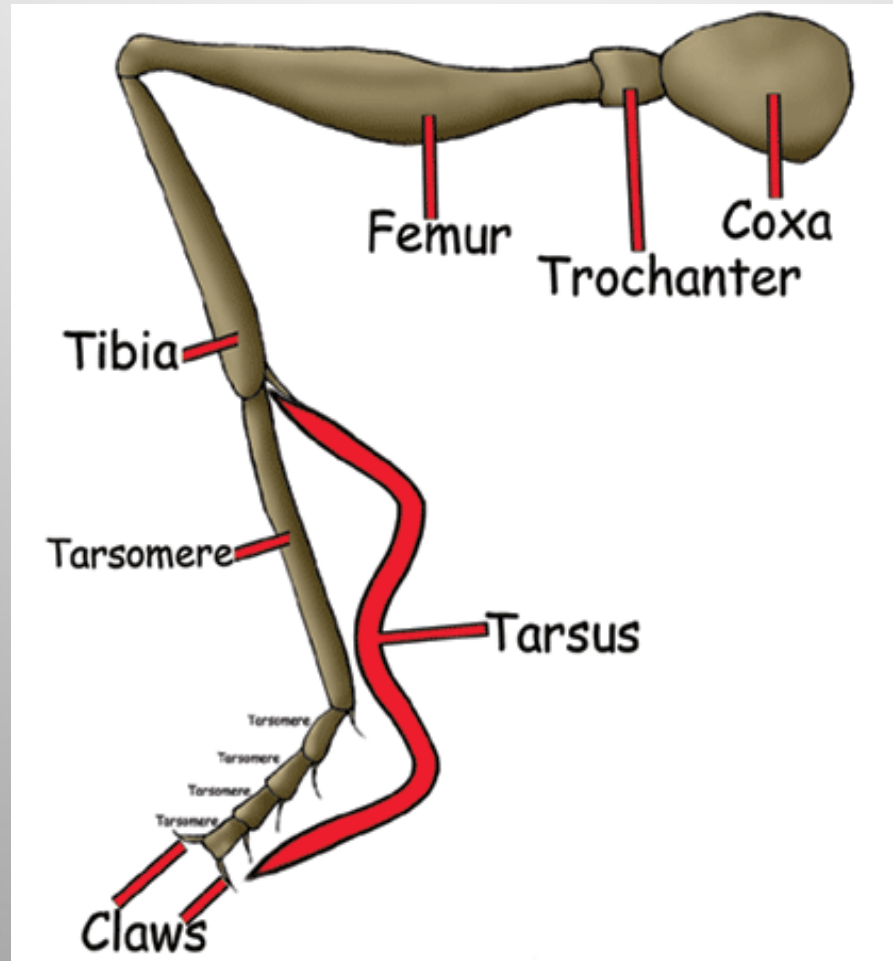
Morphology of legs

- 5- Tarsus:-

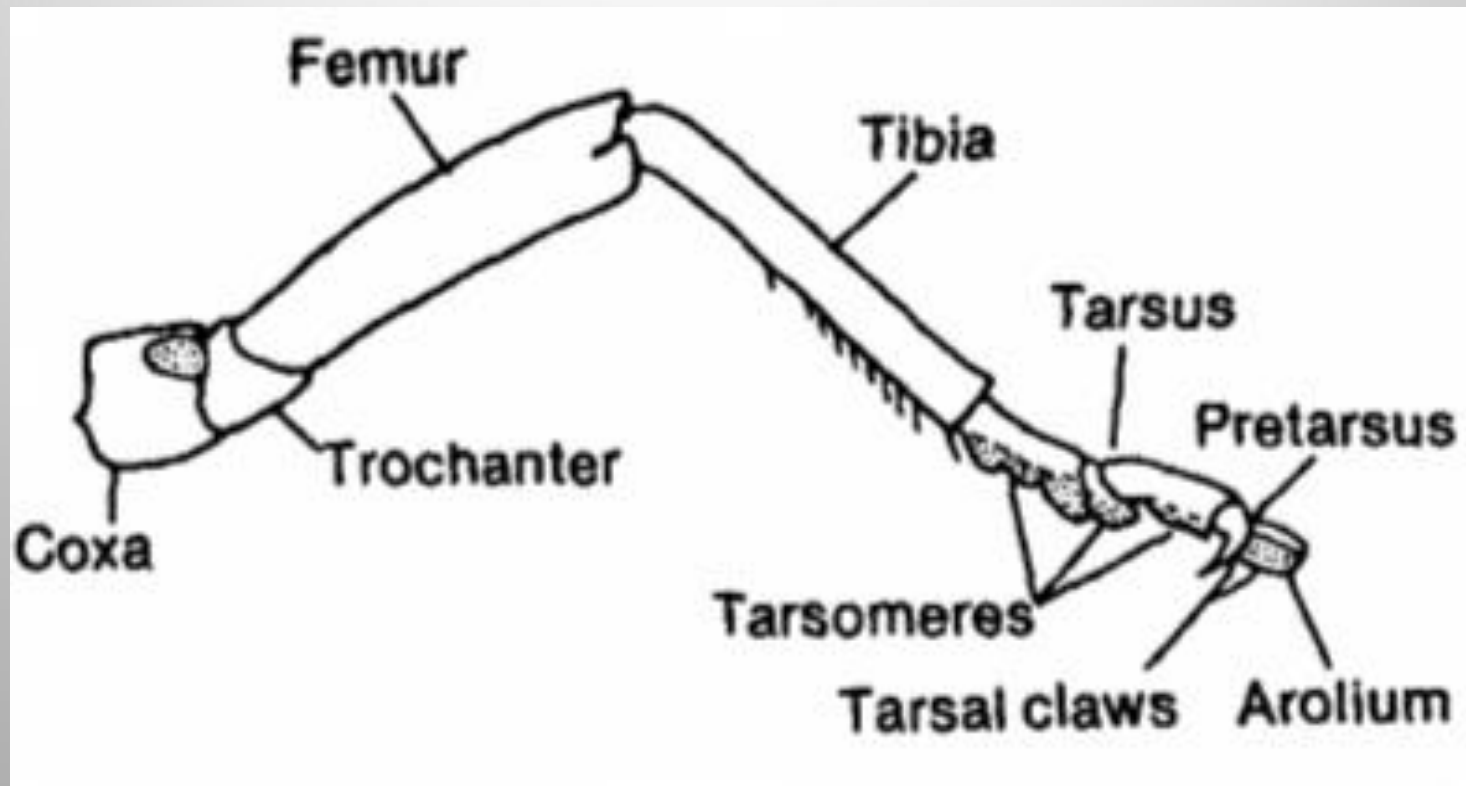
The last segment or the terminal Segment of leg, it have different size and shape with different group of insect.



The tarsus appears to be divided into three to five "pseudosegments" called **tarsomeres**. Like the mouthparts and antennae, insect legs are highly modified for different functions, depending on the environment and lifestyle of an insect



General structure of the leg



The Components of the leg

The modifications of legs(Types)

1. Ambulatory legs are used for **walking**.

Change in morphology in all segments each segment become very long.

Examples: Bugs (order Hemiptera), leaf beetles (Order Coleoptera).



Cottonwood leaf beetle

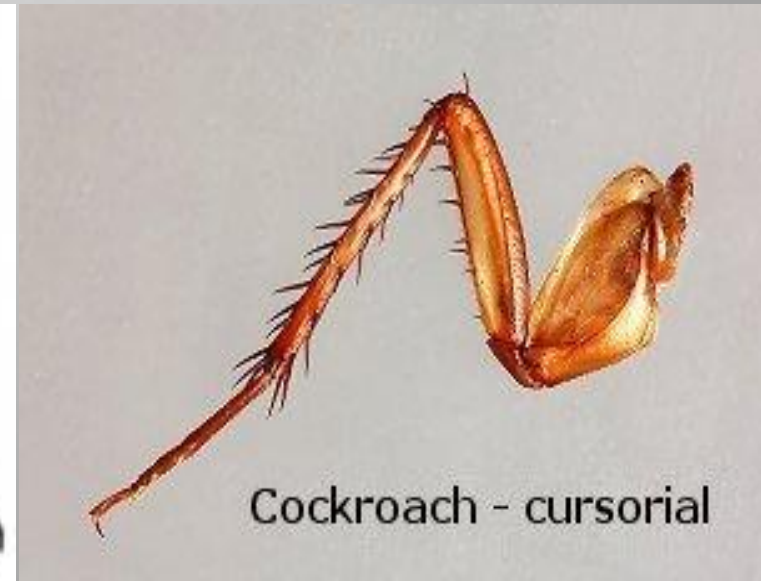
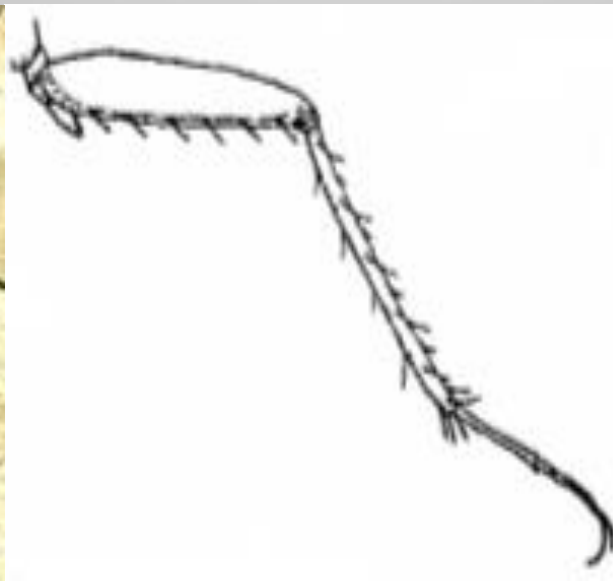


plant bug

2. Cursorial(Running) legs

Cursorial legs are modified for **running**. Note the long, thin leg segments.

Examples: Cockroaches (order Blattaria), ground and tiger beetles (order Coleoptera).

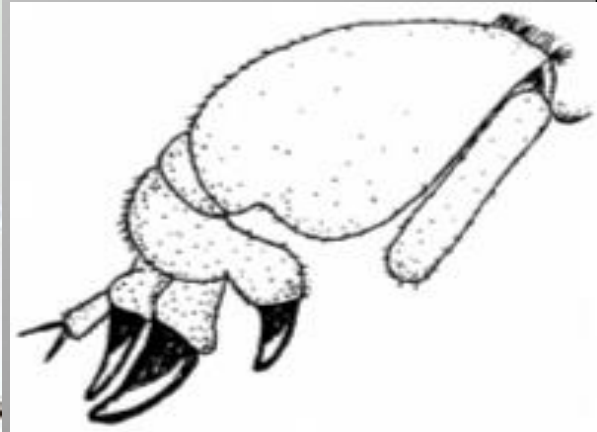


Cockroach - cursorial

Oriental cockroach

3. Fossorial(Digging legs)

The change of morphology in femur, tibia and tarsus fore legs are modified for **digging**.
Examples: Ground dwelling insects; mole crickets (order Orthoptera) and cicada nymphs (order Hemiptera).

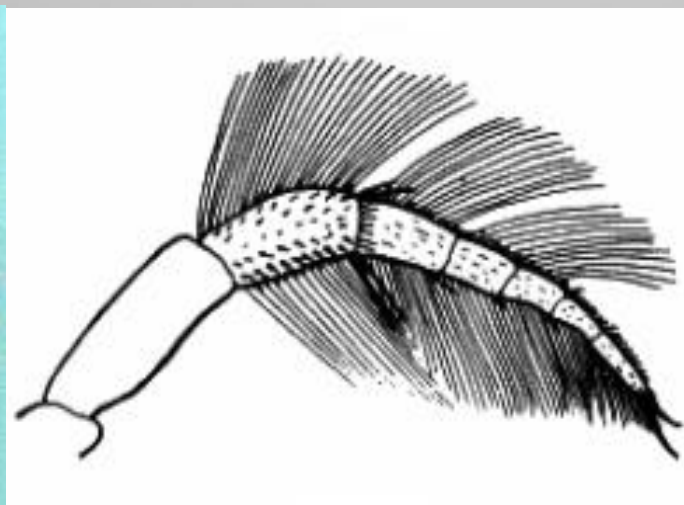


Order Orthoptera: Southern mole cricket

4. Natatorial (Swimming legs)

Change morphology femur and tibia, tarsus flat and easy for swimming and have hair for direction These legs have long setae on the tarsi.

Examples: Aquatic beetles (order: Coleoptera) and bugs (order Hemiptera).



Order Hemiptera: Backswimmer

Order Coleoptera:
Predaceous diving beetle

5. Raptorial (Grasping)

The changes of morphology in femur and tibia.

Fore legs modified for grasping (catching prey).

Examples: Mantids (order Mantodea), ambush bugs, giant water bugs and water scorpions (order Hemiptera).



Order Mantodea: Carolina mantis



6. Saltatorial(Jumping)

The change in morphology in femur which become very large and have strong muscle, hind legs adapted for jumping. Examples: Grasshoppers, crickets and katydids (order Orthoptera).

Thoracic Legs



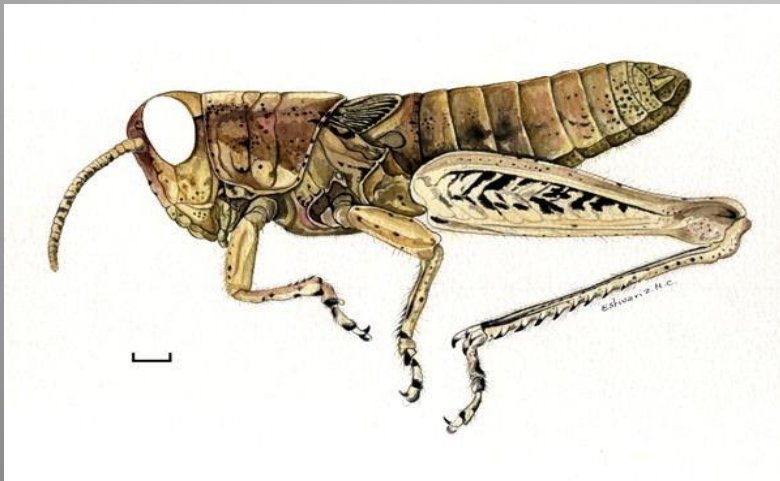
Grasshopper legs



**Order Orthoptera
Red legged grasshopper**

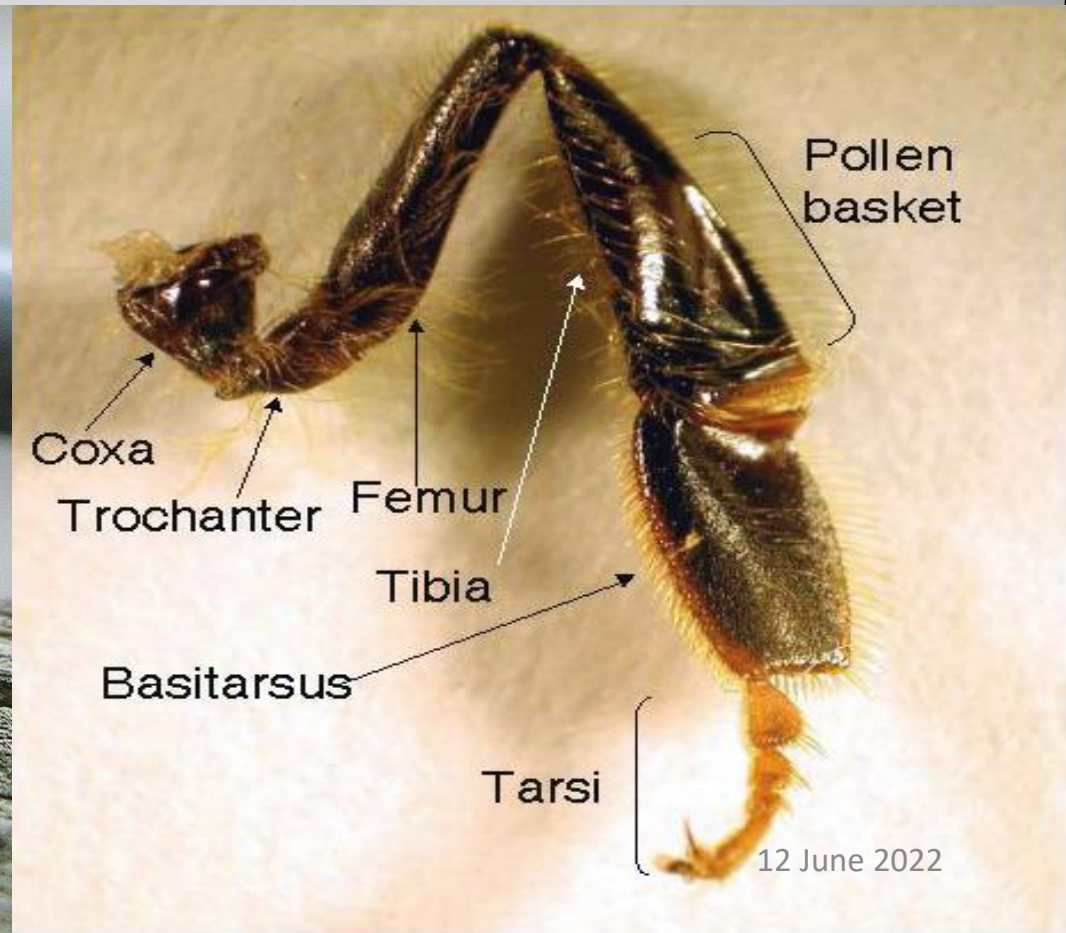


**Order Orthoptera
House cricket**



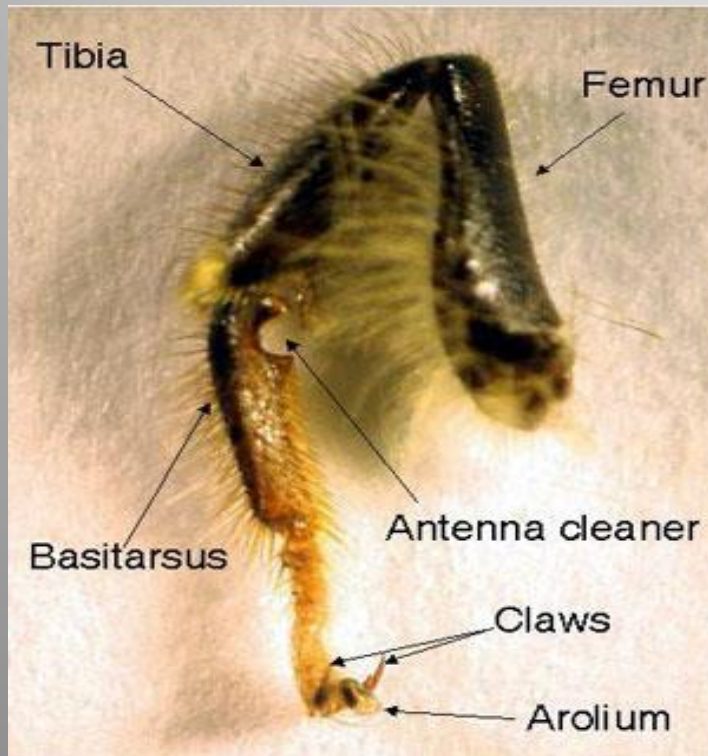
7-collecting legs

The change of morphology in tibia and tarsus, the hind legs of honeybee worker modified for collecting and carrying pollen .



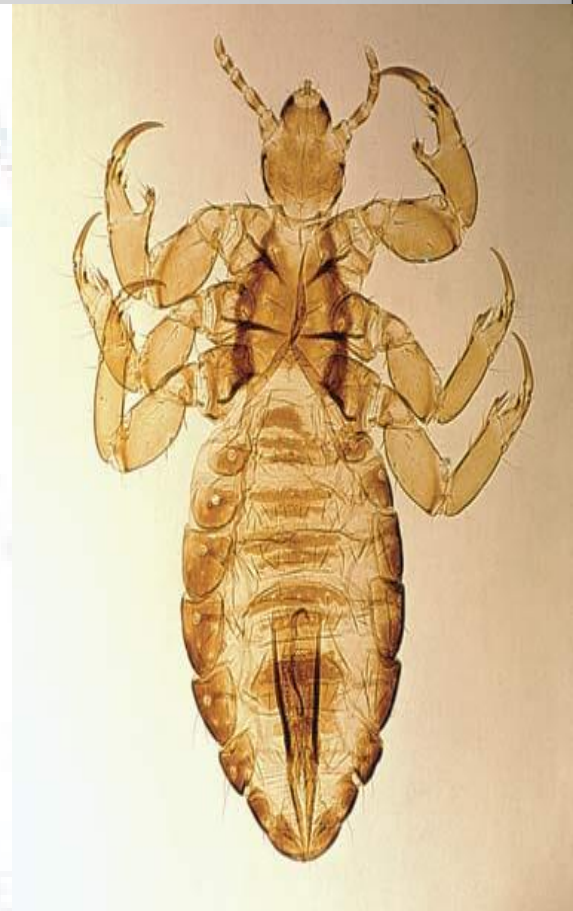
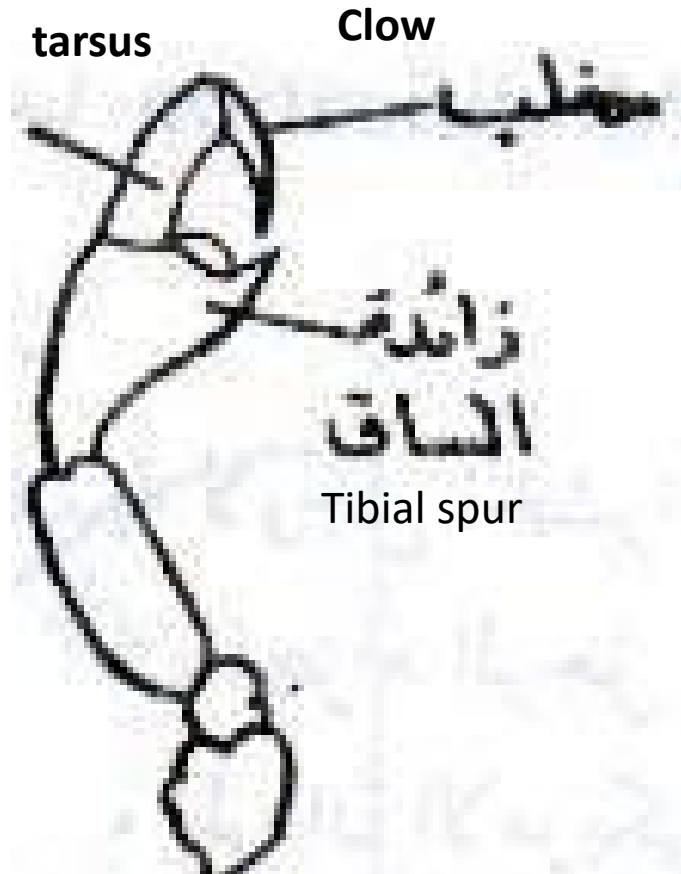
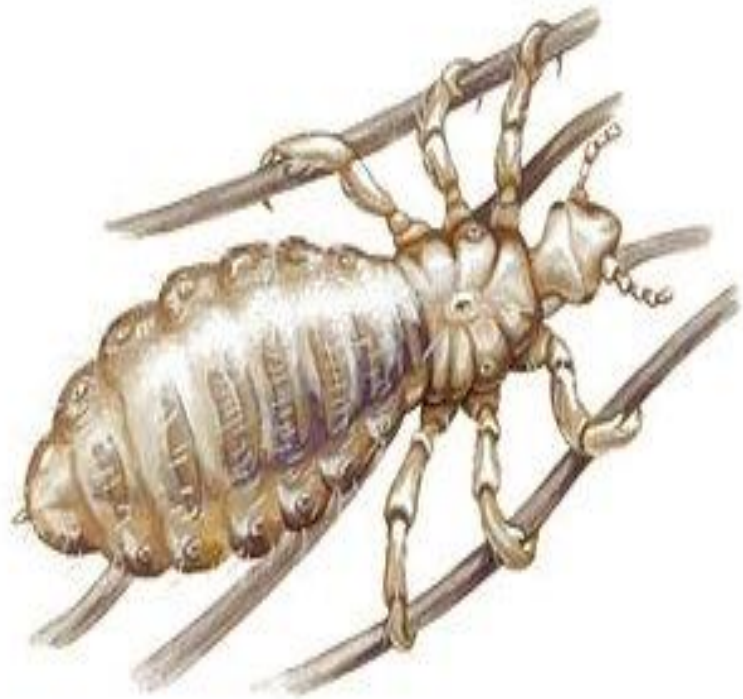
8. Cleaning legs

The change of morphology in tibia and tarsus, the fore legs of honeybee worker modified for cleaning using for cleaning antenna.



9. Clinging legs

The change of morphology in tibia and tarsus, all legs of lice modified for clinging.



10- Walking upside down (walking on smooth surface).

The change in leg that make the insect not to fall in the smooth surface. The morphology change are in (pretarsus) refers to terminal segment of the tarsus and any other structures attached to it.

The pretarsus compose of **Claw** and **spongy plate** called **Arolium**

Ex: All legs of housefly

11- Clasping or Mating

The changes of morphology in tarsus, the tarsus is flattened with adhesive discs which are useful to clasp the mate during copulation

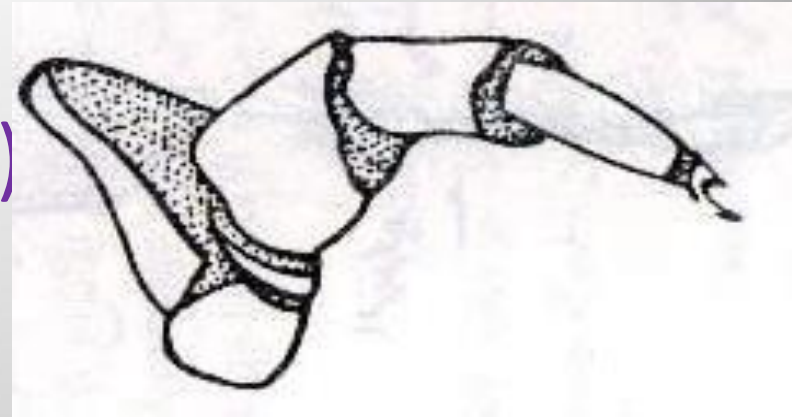
e.g. Forelegs of Male Water Beetle



12-Larval Legs

A - True legs (Thoracic legs)

(True legs)



B - Prolegs (Abdominal legs)

