

Practical Insects

2nd Level



TOPICS	
Lab 1,2	Class insects , Classification of <u>periplaneta amreicana</u>
Lab 3	Head (Antenna)
Lab 4	Head (Mouth parts)
Lab 5,6	Thorax (Legs) , Thorax (Wings)
Lab 7,8	Digestive system , Nerve system
Lab 9	Respiratory system
Lab 10	Metamorphosis , Immature stage

First Exam	
Second Exam	

LAB 1

Class: Insects



Site of insects in the animal kingdom.

Kingdom: Animalia.

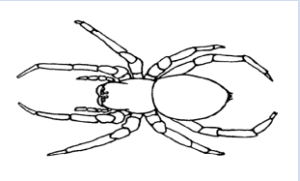
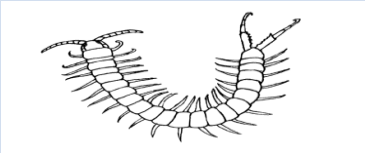
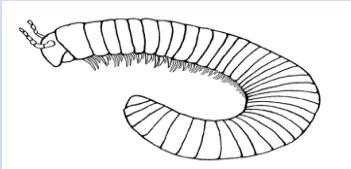
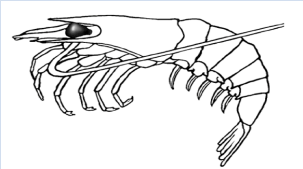
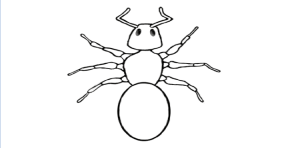
Phylum: Arthropods.

All arthropods possess:

- 1.Exoskeleton.**
- 2.Jointed limbs and jointed mouthparts.**
- 3.Bilateral symmetry.**
- 4.Ventral nerve cord.**

Five classes of Arthropods are:

- 1.arachnida.**
- 2. chilopods.**
- 3 diplopods.**
- 4. crustaceans**
- 5. hexapods.**

arachnida	Chliopods	Diplopods	Crustaceans	Insects
2 body segments	Many segments	Many segments	3 body segments	3 body segments
8 legs	1 pair of leg per body segments	2 pair of leg per body segments	Varied number of legs	6 legs
No antennae 	1 pair of antennae 	1 pair of antennae 	2 pair of antennae 	1 pair of antennae 

LAB 2

Classification of Periplaneta americana

Classification of Periplaneta americana

Kingdom: Animalia.

Phylum: Arthropods.

Sub- phylum: Mandibulata.

Class: insects (hexapods).

Order: Dictyoptera.

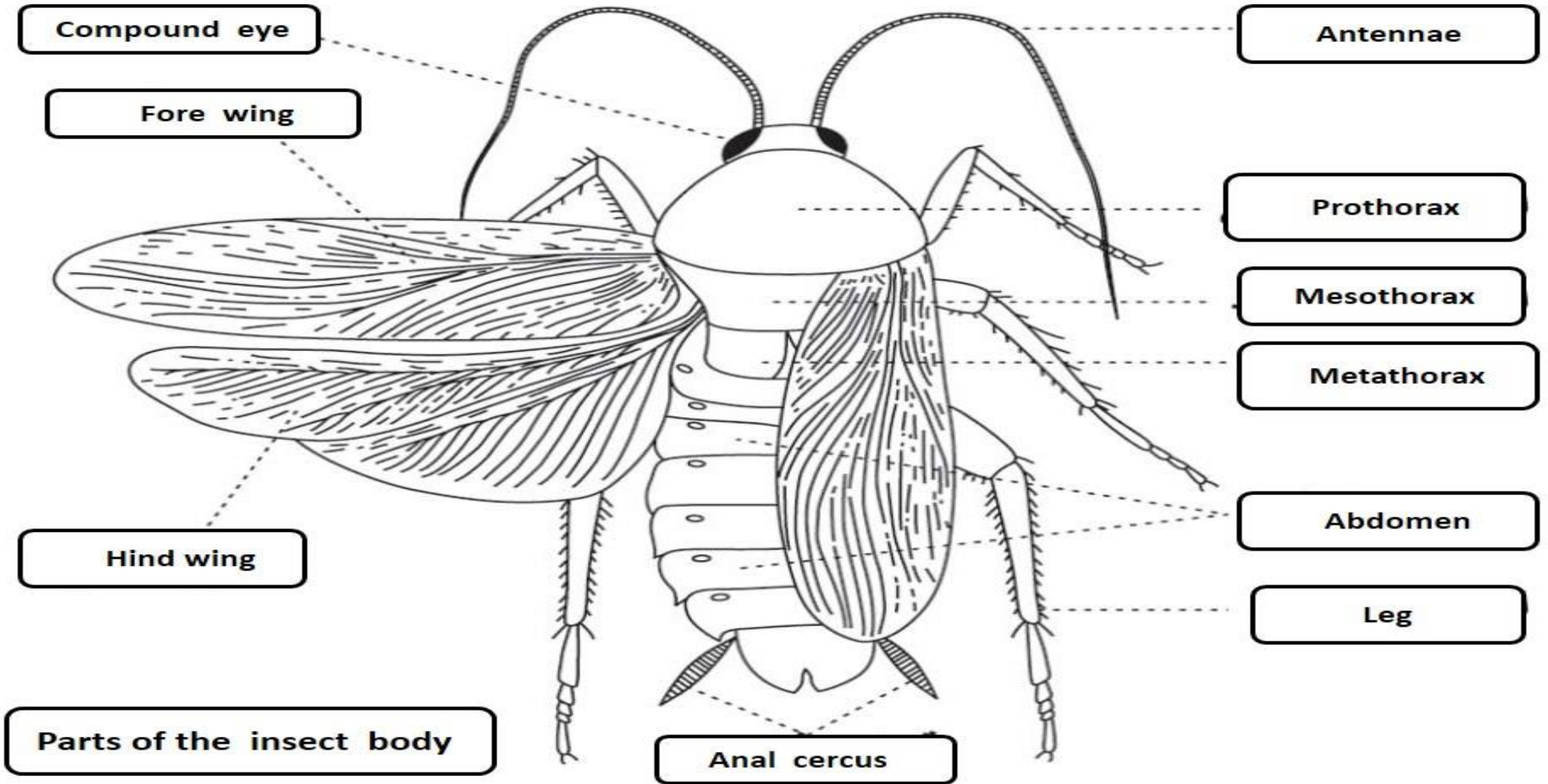
Genus: Periplaneta americana.



The cockroach specifications as an animal belongs to class insect (hexapods).

- 1. The body is divided into head, thorax and abdomen.**
- 2. 1 pair of antennae.**
- 3. (3) pair of legs.**
- 4. (2) pair of wings or (1) pair of wings or with out wings.**
- 5. The respiratory system is kind of tracheal.**

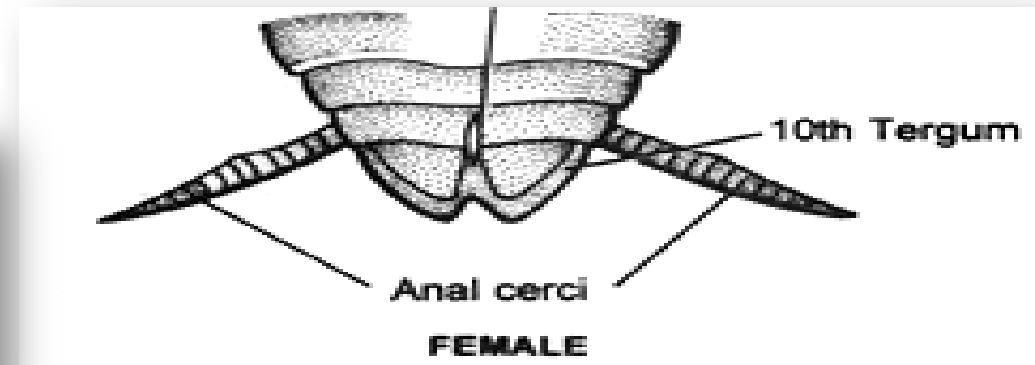




The difference between male & female (end of abdomen) of cockroach:

Male: (1) pair of anal style that located in the 9 abdomen segment and (1) Pair of anal cercus that located between 9 and 10 segment.

Female: (1) pair of anal cercus only that locates between 9 and 10 segment.



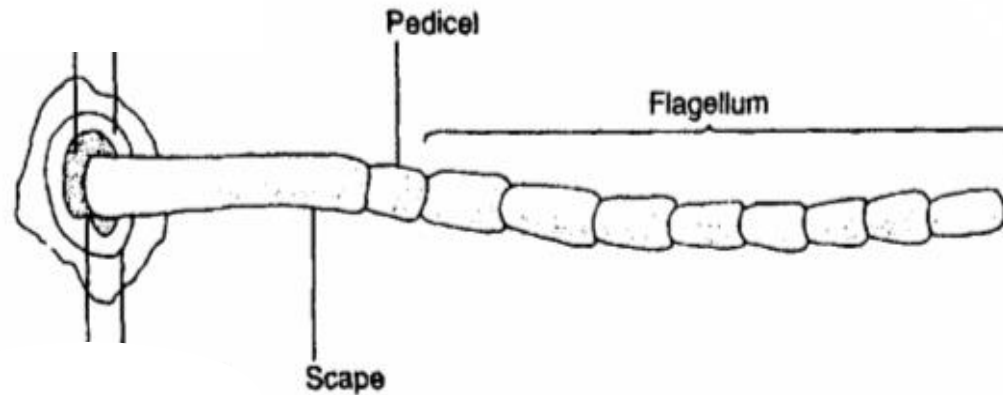
LAB 3

Head (Antennae)



Antennae consists of :

- 1. Scape (1 segment).**
- 2. Pedicel (1 segment).**
- 3. Flagellum (many segment).**

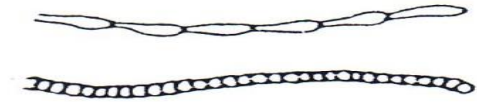


Types of Antennae

- 1. Capitate antennae .**
Ex: Order Coleoptera .



- 2. Filiform antennae .**
Ex: Order Odonata



- 3. Geniculate antennae .**
Ex : Order Hymenoptera.



- 4. Lamellate antennae .**
Ex : Order Coleoptera .



5. Moniliform antennae

Ex: Order Isoptera.



6. Pectinate antennae

Ex: Order Coleoptera



7. Setaceous antennae .

Ex : Order Dicyptera.



8. Plumose antennae .

**Ex: Order Lepidoptera ,
Diptera**



9. Serrate antennae .

Ex : Order Coleoptera .



10. Aristate antennae .

Ex : Order Diptera .



11. Clavate antennae

Ex: Order Lipdoptera



LAB 4

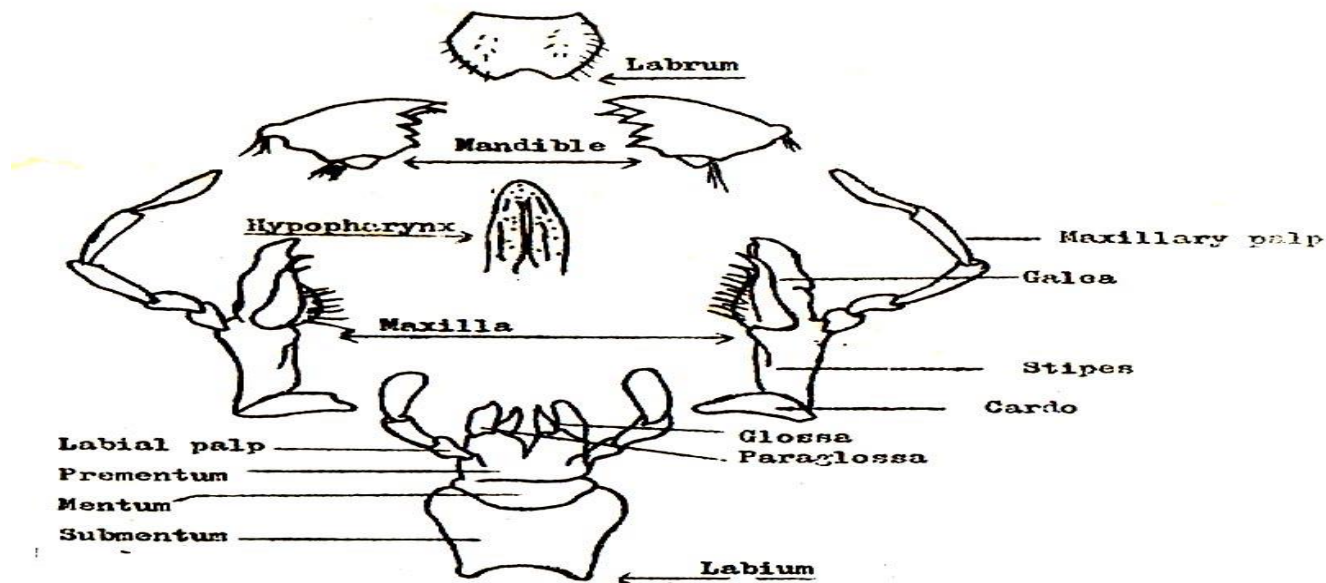
HEAD (Mouthparts)



Mouthparts

The 4 main mouthparts are the :

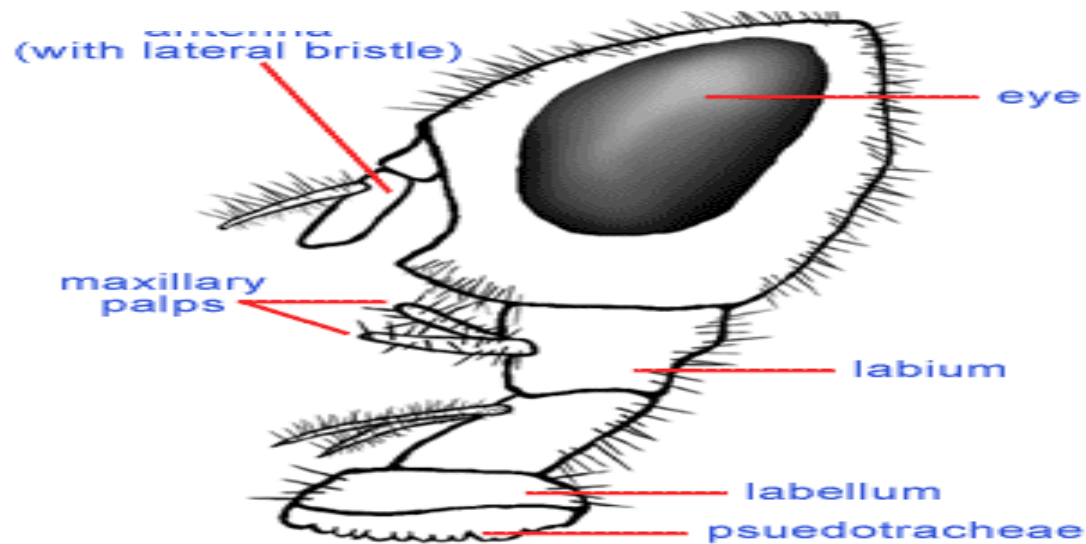
1. Labrum (upper lip).
2. Mandibles (Jews).
3. Maxillae(Maxillary palps, lacinia , galea , stipe , cardo)
4. Labium (Lower lip) - (Labial palps , paraglossa , glossa, prementum , mentum , submentum).



Types of mouthparts :

1. Sponging mouthparts

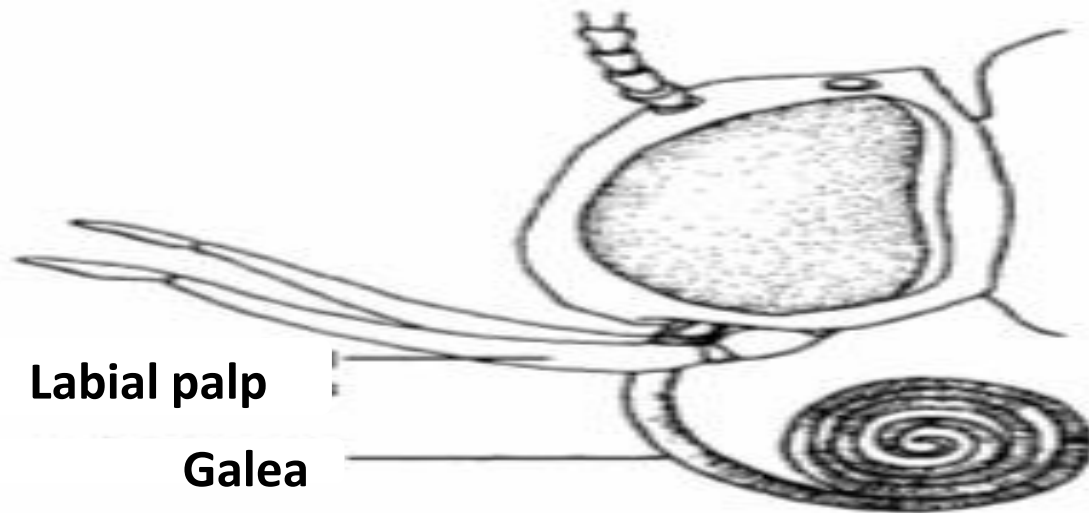
Ex : Order Diptera .



2. Siphoning mouthparts.

Ex: Order lepidoptera

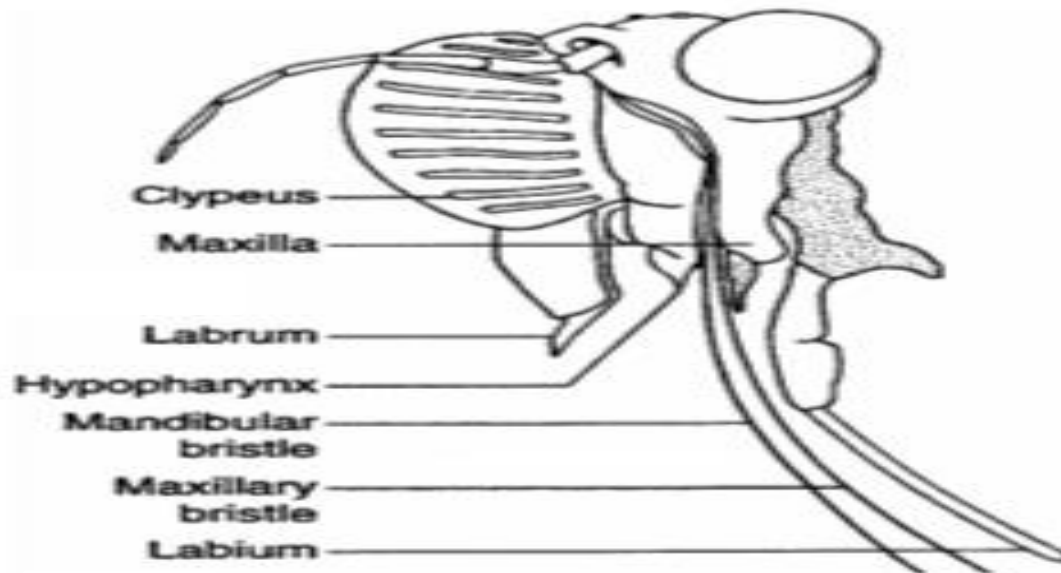
Order hymenoptera.



3. Piercing – sucking mouthparts.

Ex : Order Hemiptera

Order Diptera .



LAB 5

Thorax(Legs)



THE THORAX

the thorax is divided into three parts ,These segments are named as follows:

1.Prothorax –first (first pair of true legs, wings are never).

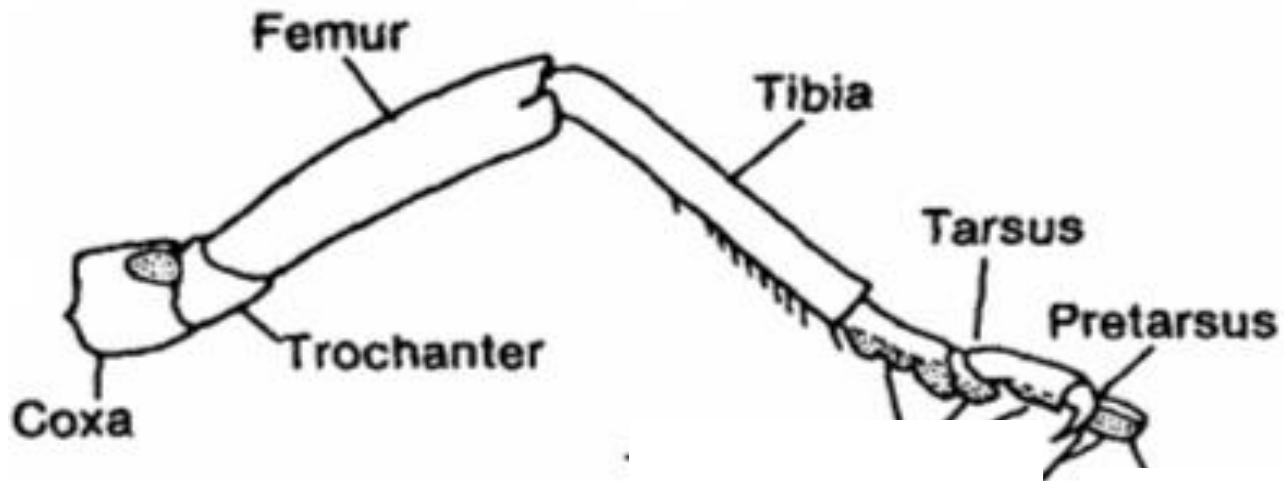
2.Mesothorax – (meso = middle) it bears the second pair of true legs and the first pair of wings.

3.Metathorax – (meta = last) it bears the third pair of true legs and the second pair wings

Legs

Each leg has six major components :

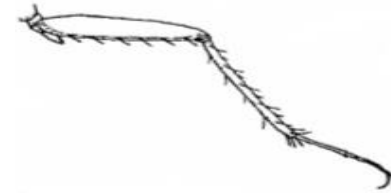
coxa , trochanter , femur , tibia , tarsus , pretarsus .



Types of legs

1. Walking legs or running : all legs(long & thin leg segment.

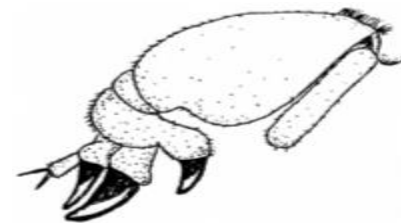
**Examples: order Hemiptera
order: Coleoptera**



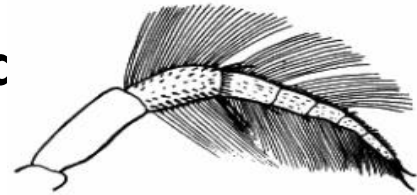
**2. Jumping legs : hind legs (femur and tibia).
Examples : order Orthoptera**



**3. Digging legs : fore legs are modified.
Examples : order Orthoptera.**



4. Swimming legs : hind legs are modified
Examples : order Coleoptera



5. Grasping legs : fore legs modified .
Example: order Hemiptera



LAB 6

Thorax (Wings)

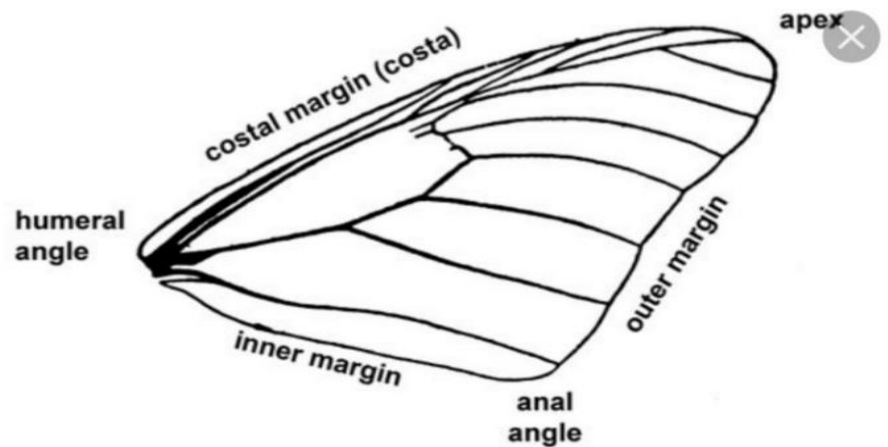


Wings Margin

- 1.Costal margin.**
- 2.Outer margin.**
- 3.Inner margin.**

Wing angle

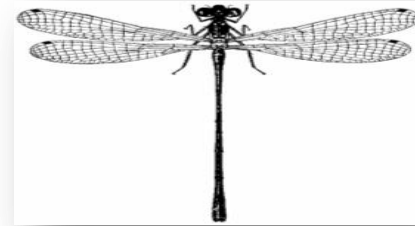
- 1.Humeral angle: located between the costal & inner edge.**
- 2.Apex angle: located between the costal & the outer edge.**
- 3.Anal angle: located between the outer & the inner edge.**



Types of wings

1. Membranous wings

Ex: order Odonata, Diptera, Hymenoptera, Isoptera.



2. Halteres

Ex: order Diptera.



3. Elytra

Ex: order Coleoptera.



4. Tegmina

Ex: order Orthoptera.



5. hemelytra.

Ex: order Hemiptera.



6. scaly..

Ex: order Lepidoptera.

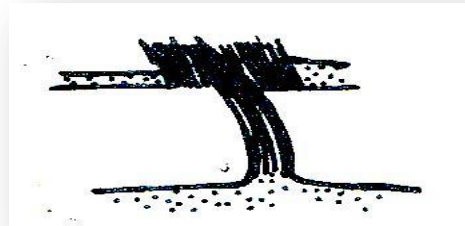
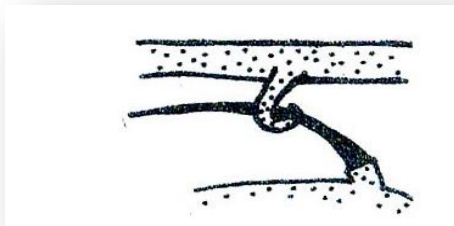


Wing coupling apparatus

1. Hamulate type: in order: Hymenoptera.



2. Frenate coupling: in order: Lepidoptera.



3. Jugate coupling: in order: Diptera.



LAB 7

Internal anatomy

Digestive system

Digestive system: consists of:

Alimentary canal:

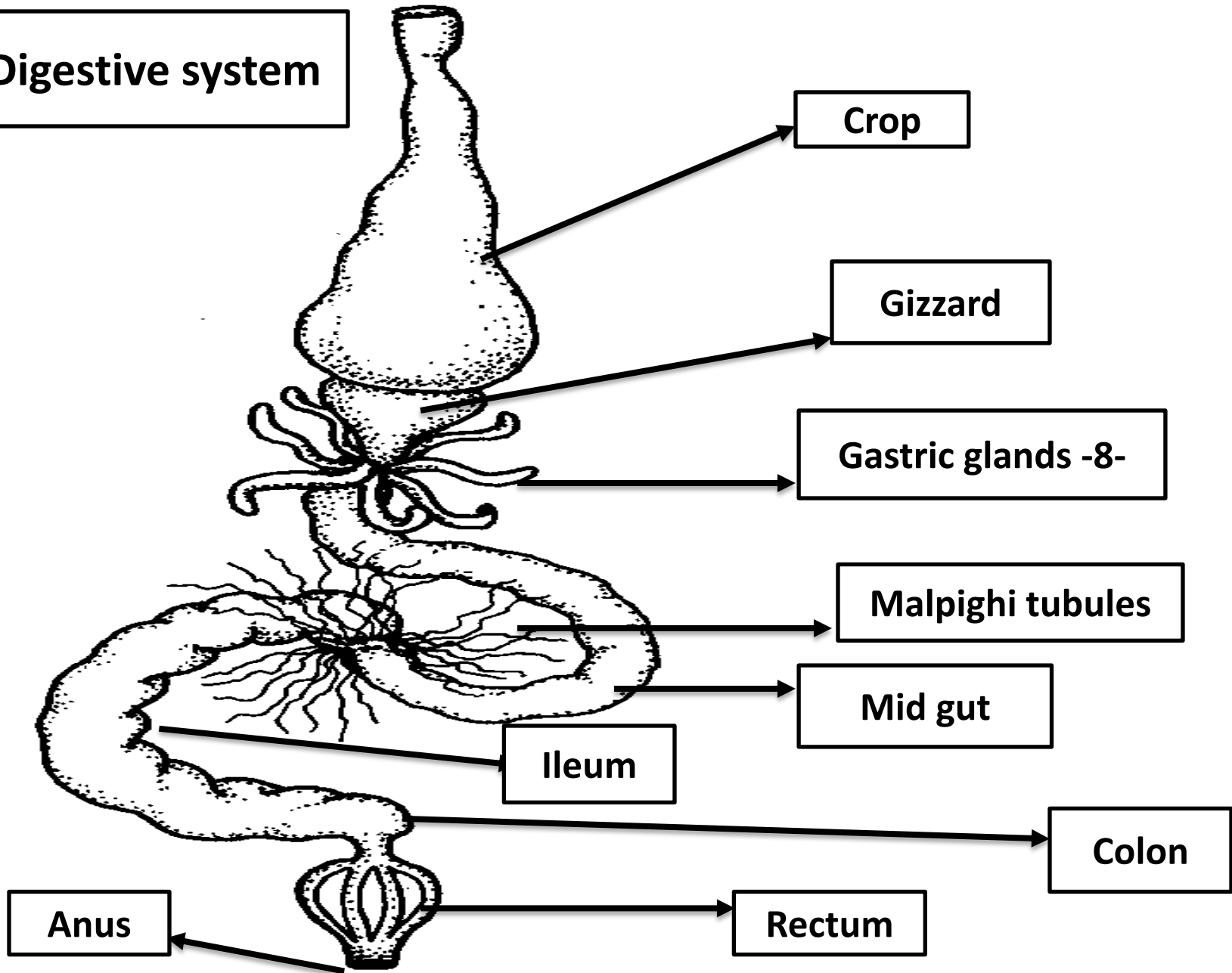
- 1. Fore gut (Stomodaeum) Crop , gizzard.**
- 2. Mid gut (mesentreic)**
- 3. Hind gut (Proctodum) ileum , colon, rectum.**

Glands :

- 1. Salivary glands.**
- 2. Gastric glands (8) .**
- 3. Malpighian tubules .**
- 4. Rectum glands.**



Digestive system



LAB 8
Internal anatomy
Nerve system

The nervous system Consists of three devices connected to each a central nervous system and peripheral nervous system and sympathetic nervous system.

Central Nervous System:

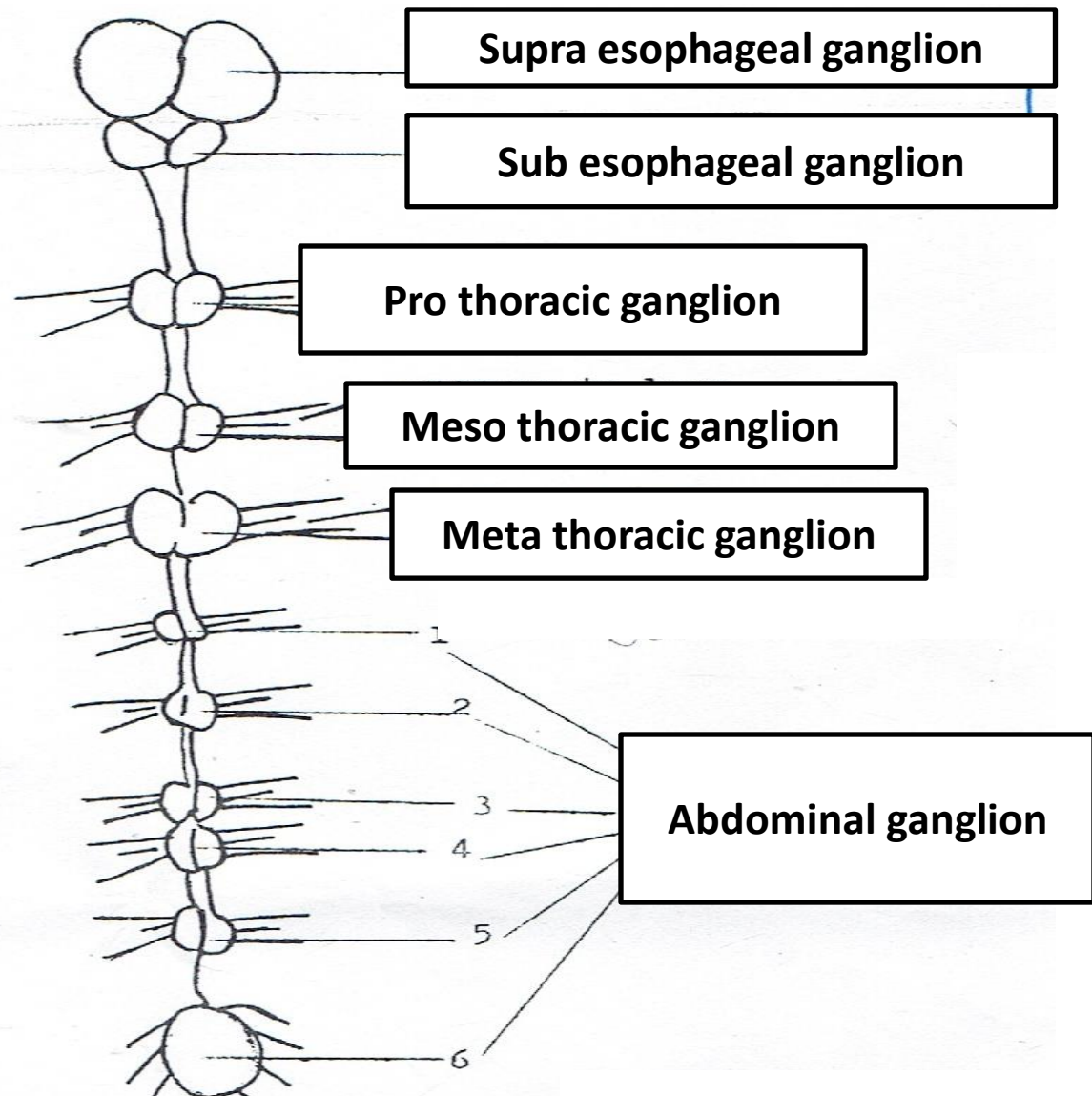
1. Brain

- a. supra esophageal ganglion.**
- b. sub esophageal ganglion.**

2. Ventral Nerve Cord

- a. thoracic ganglion**
- b. abdominal ganglion (6).**

The central nerve system

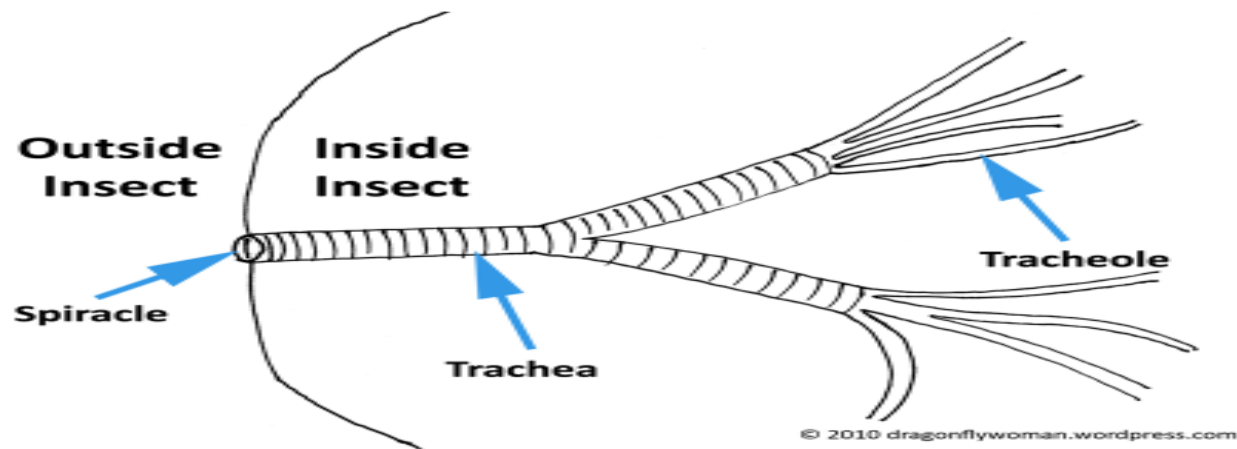


LAB 9

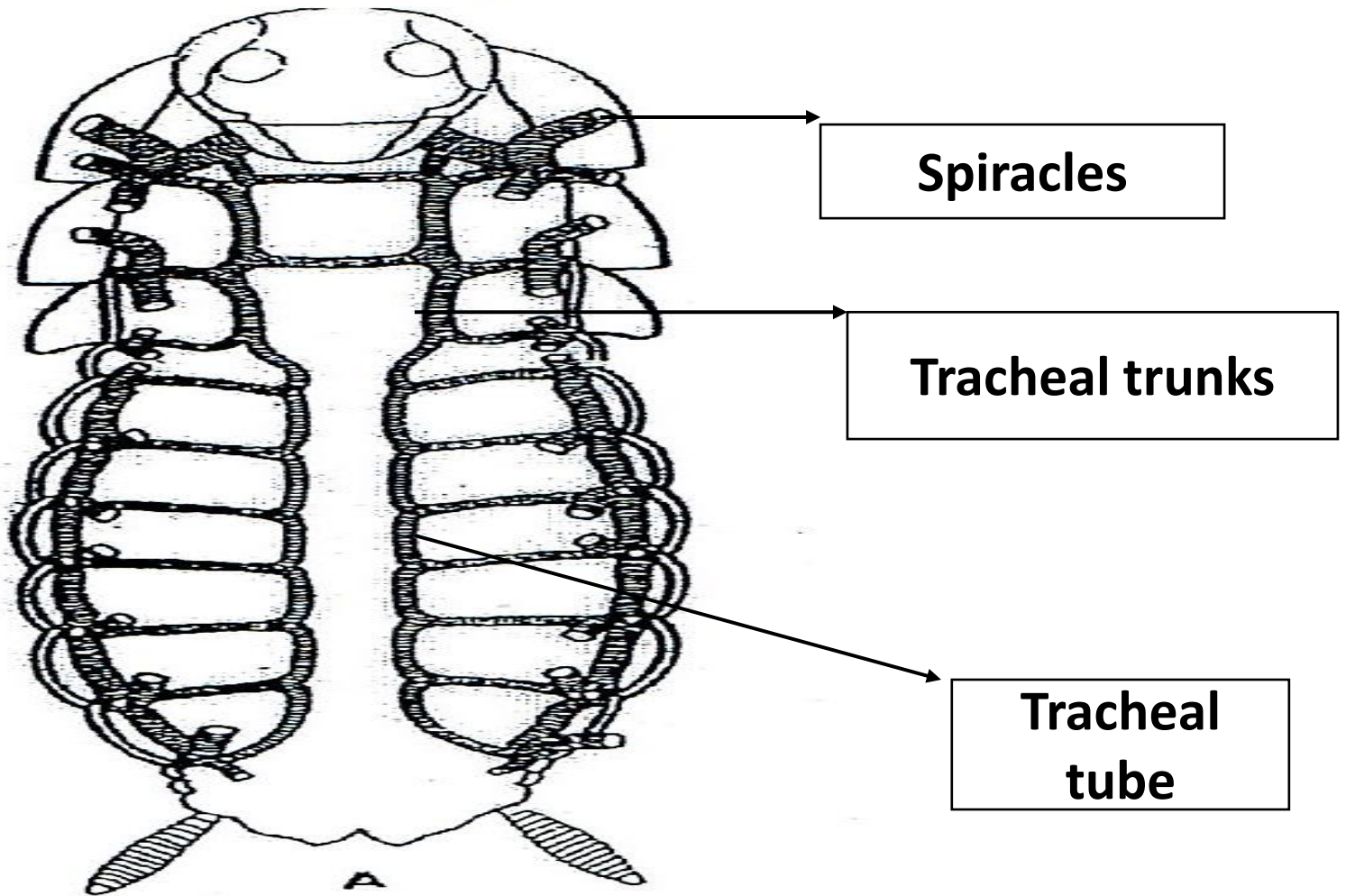
Internal anatomy Respiratory system

Respiratory System (Tracheal system): consists of:

- **Tracheal trunks (2).**
- **Tracheal tubes.**
- **Spiracles (pair in each segment 2-3 , 1-8).**



Respiratory System

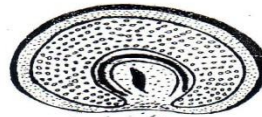


The types of spiracles :

1. Simple spiracle.



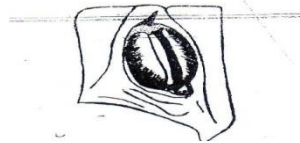
2. Sieve –plate spiracle.



3. Sinuous spiracle.



4. lipped spiracle.



5. Digitate spiracle.

