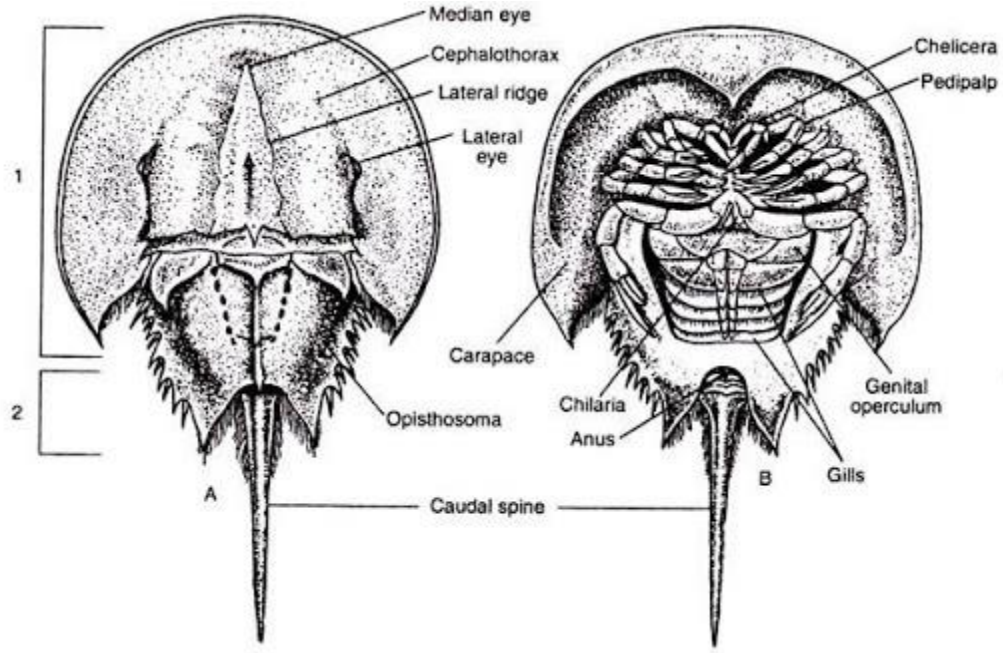
Identification of some Arthropod specimens

Classification followed as per CBCS syllabi of V.U. i.e. upto class and after Rupert & Barnes, 1994.

I. Limulus sp.



A. Dorsal View, B. Ventral View

Systematic Position

Phylum- Arthropoda
Sub phylum- Chelicerata
Class- Merostomata

Identifying Characters

1. Presence of externally jointed appendages.
2. Body covered by an exoskeleton formed of chitinous cuticle.
3. Body cavity - haemocoel.

….So, Phylum- Arthropoda

1. Body with anterior prosoma (cephalothorax) and posterior opisthosoma (abdomen).
2. Prosoma with six pairs of appendages - the first pair or 'chelicerae' are pre-oral in position, the second pair are pedipalps and the last four pairs are walking legs.
3. Neither mandible, nor antenna.

….So, Subphylum- Chelicerata

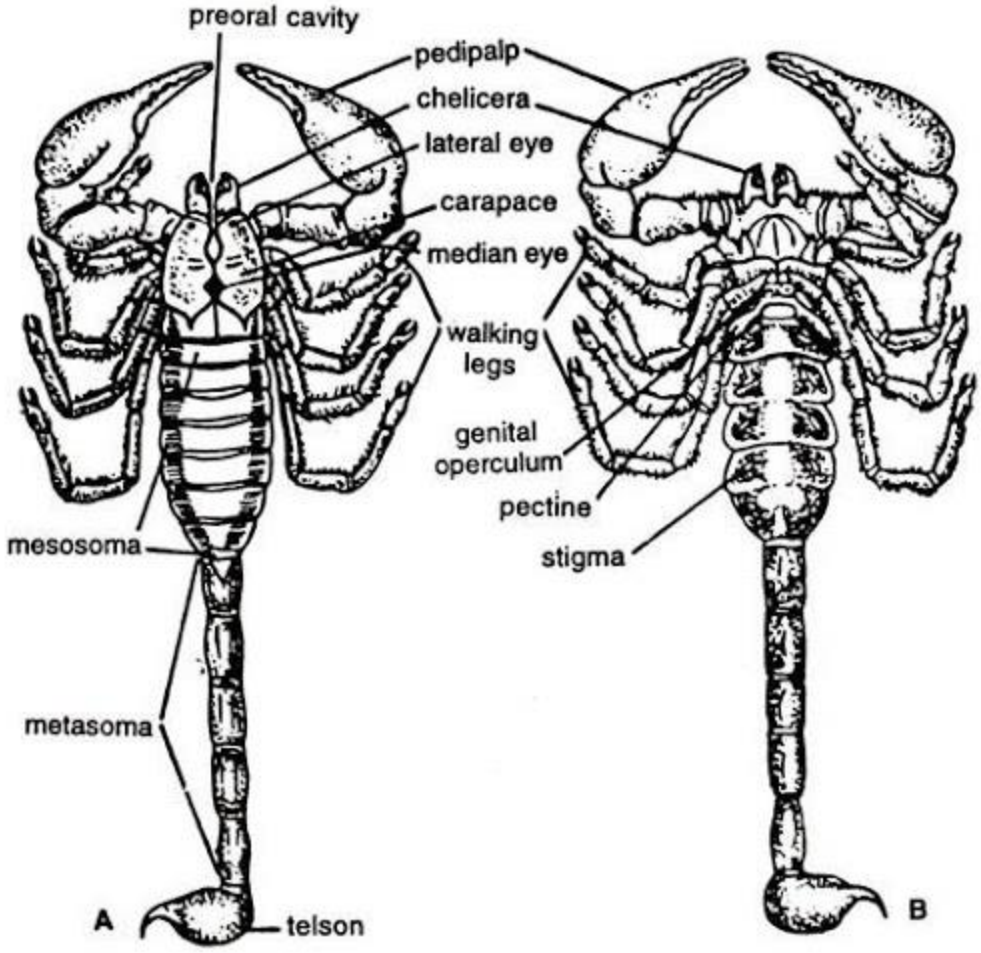
1. Presence of both simple and compound eyes.
2. Opisthosoma is divided into mesosoma containing appendages and a metasoma without appendage but with a spine like telson.
3. Respiration by book gill

…..So, Class- Merostomata

1. Carapace horse shoe shaped.
2. A median longitudinal ridge & two lateral grooves present on carapace.
3. Opisthosoma hexagonal with 6 pairs of movable spine along its border.
4. Mesosomatic appendages are genital operculum and leaf like book gills.
5. Anus ventral, at the base of telson or caudal spine which is freely movable.

….. So, the specimen- *Limulus sp*.

II. Palamnaeus sp.



A. Dorsal View, B. Ventral View

Systematic Position

Phylum- Arthropoda
Sub phylum- Chelicerata
Class- Arachnida

Identifying Characters

Upto Sub phylum same as *Limulus*.

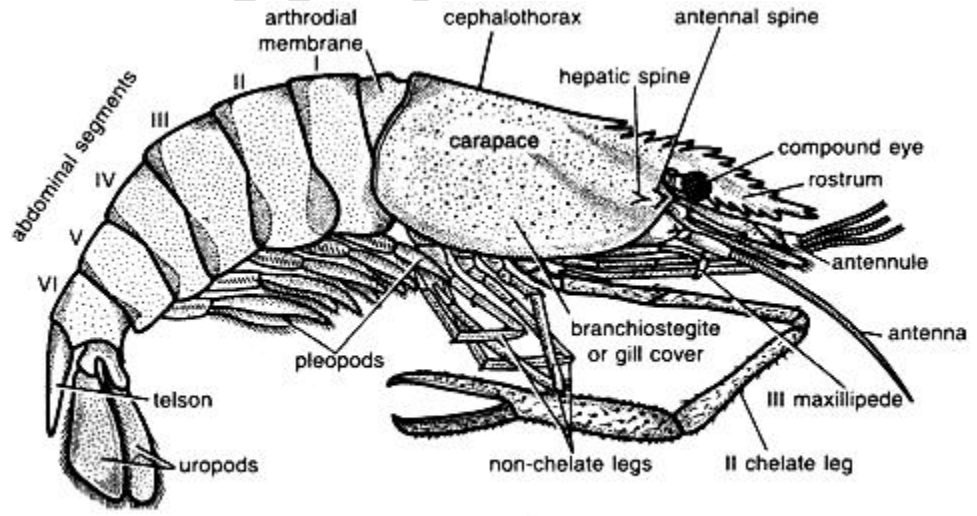
1. Cephalothorax with two pairs of jointed chelate appendages (chelicerae & pedipalps) and four pairs of walking legs.
2. Eye sessile, usually simple.
3. Respiration by trachea.
4. Abdomen without appendages,

….. So, Class- Arachnida

1. Elongated, dorsoventrally flattened body.
2. Pedipalp large, 6 segmented & raptorial.
3. Abdomen 12 segmented
4. The terminal metasomal segment or telson bulb like, with curved, pointed sting.

…. So, the specimen- *Palamnaeus sp.*

III. Palaemon sp.



Lateral View

Systematic Position

Phylum- Arthropoda
Sub phylum- Crustacea
Class- Malacostraca

Upto Phylum same as *Limulus*.

1. Body is divided into cephalothorax and abdomen.
2. Presence of one pair of antennules & one pair of antennae in head.
3. Presence one pair of mandible and two pairs of maxillae.
4. Swimming appendages are biramous and abdominal.
5. Excretion by green gland or antennary gland.

…. So, Sub phylum- Crustacea

1. Number of segments 8 in thorax and 6 in abdomen.
2. One pair of stalked compound eyes present.
3. Antennule with many jointed flagella.
4. Abdominal appendages are similar type.
5. The appendages of the last segment are typically flattened into uropod.

…. So, class- Malacostraca

1. Well-developed carapace drawn anteriorly into an upturned rostrum, with 6/7 dorsal teeth and 4/5 ventral teeth.
2. The first two pairs of walking legs *(these are thoracic & known as pereopods*) are chelated.
3. Body elongated, with cylindrical cephalothorax and an abdomen which is rounded dorsally and compressed laterally.

…. So, Specimen- *Palaemon sp.*

IV. Cancer sp.

Systematic Position

Phylum- Arthropoda
Sub phylum- Crustacea
Class- Malacostraca

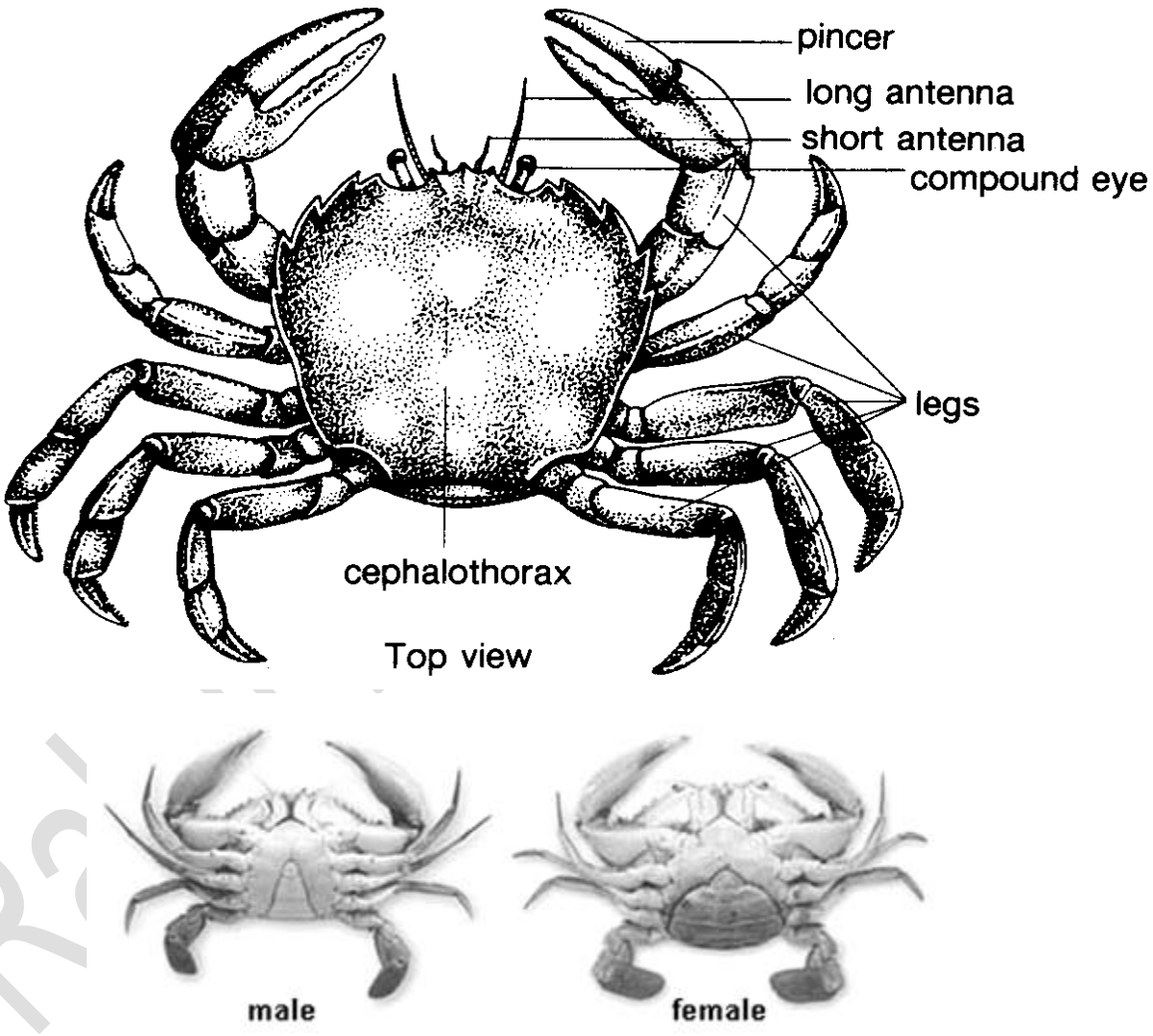
Upto class same as *Palaemon sp.*

1. Cephalothorax large, carapace oval & broader transversely.
2. Abdomen reduced, hard and bent & fixed under cephalothorax.
3. Antennules & eye stalks lodged in sockets of carapace.

4. Thoracic legs 5 pair of which first one is chelated.

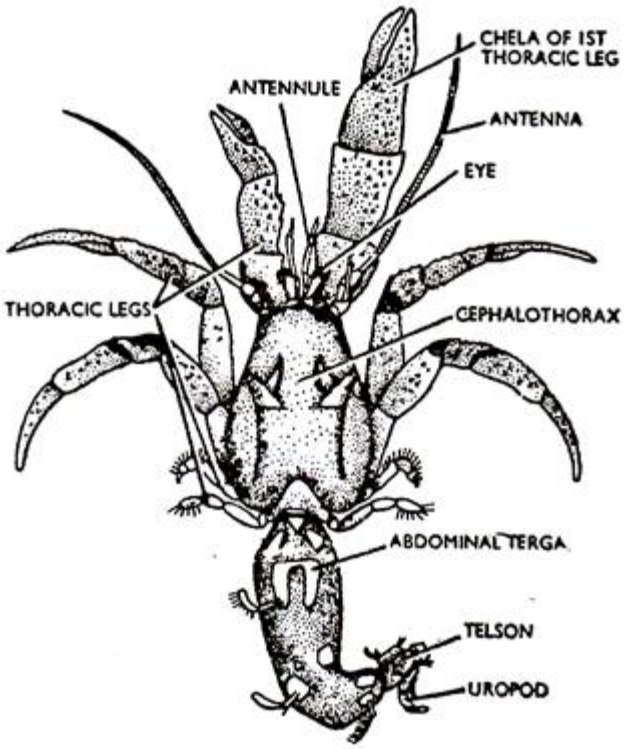
…. So, Specimen- Cancer *sp*.

N.B. The animal shows sexual dimorphism. If you are provided with males and female specimen, you can identify them by following means: *abdomen is narrower in male and broader in female.* Chela is usually larger in male than the female, but this point can not be always useful.

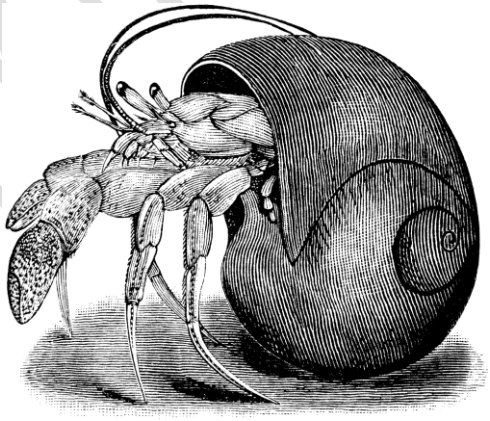


Ventral view showing the difference between Male & Female

V. Eupagurus sp.



Entire specimen



Specimen within Gastropod shell

<u>Systematic Position</u>

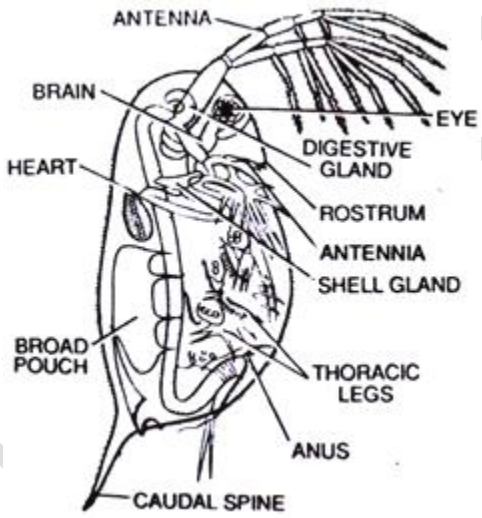
Phylum- Arthropoda
Sub phylum- Crustacea
Class- Malacostraca

Upto class same as *Palaemon sp.*

1. Body asymmetrical, cephalothorax flat & broad.
2. Abdomen soft, fleshy, coiled.
3. First thoracic leg large and chelated, other reduced.
4. Right chelate larger.
5. Uropod hook like.

…. So, Specimen – *Eupagurus sp.*

VI. Daphnia Sp.



Systematic Position

Phylum- Arthropoda
Sub phylum- Crustacea
Class – Branchiopoda

Upto sub phylum same as *Palaemon sp.*

1. Body and appendages leaf like and latter contain gills.
2. Body may or may not be enclosed by carapace and antennae may help in locomotion.
3. Telson ramified mostly.

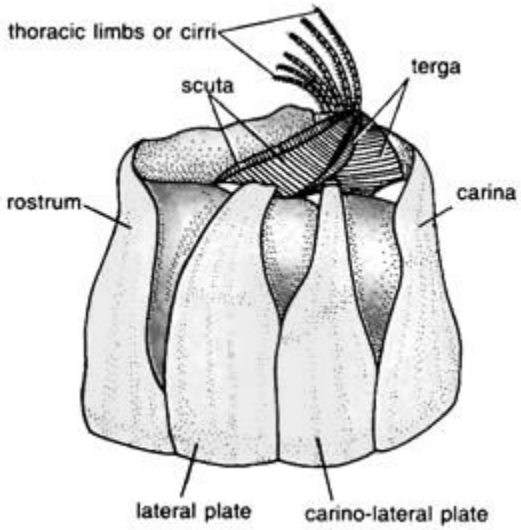
…. So, Class- Branchiopoda

1. Bilaterally compressed body with anterior pointed beak like rostrum & posterior caudal spine.
2. Head rounded with biramous antennae.

3. Thoracic appendages 5 pairs; no abdominal appendages.
4. Eye compound & sessile.
5. Body transparent
6. Females with bood pouch near back.

…..So, Specimen – *Daphnia sp*.

VII. Balanus sp.



<u>Systematic Position</u>

Phylum- Arthropoda
Sub phylum- Crustacea
Class- Cirripedia

Upto sub phylum same as *Palaemon sp.*

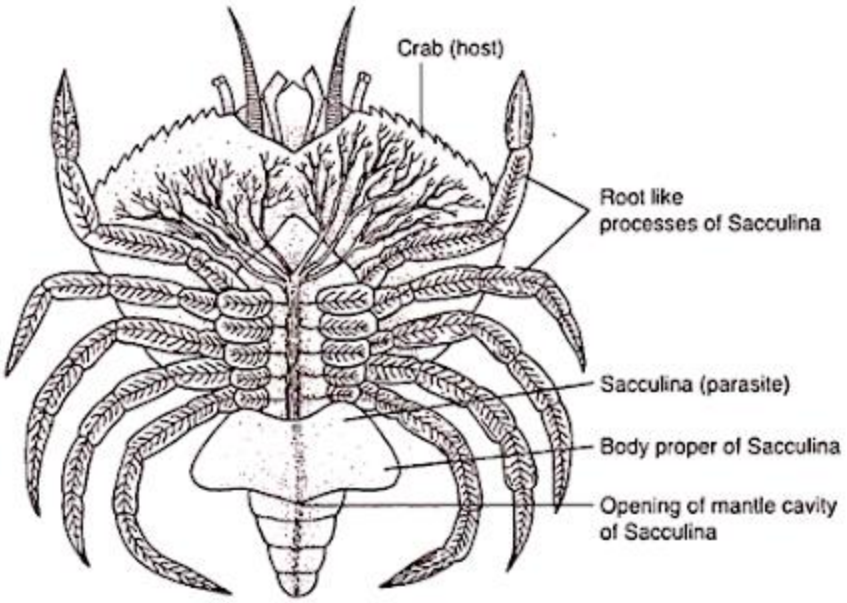
1. Body encased in calcified plates, segmentation indistinct.
2. Six pairs of cirri form thoracic appendages, helkp in feeding.
3. Absence of eyes and abdomen.
4. Saccular carapace.

….So, Class- Cirripedia

1. Individually enclosed by 6 calcareous plates, united immovably.
2. The opening of shell can be closed by two plates (two scuta and two terga).
3. Thoracic appendages protruded out through opening.

….So, Specimen- *Balanus sp.*

VIII. ***Sacculina sp.***



Systematic Position

Phylum- Arthropoda
Sub phylum- Crustacea
Class- Cirripedia

Upto Subclass same as *Balanus sp.*

1. Compressed fleshy tumour like body, attached to the ventral side of the crab.
2. Mouth, appendages, segmentation & anus absent.
3. From attached end, numerous roots like processes enter the host body.
4. Cloacal opening posterior.
5. Genital aperture prominent.

….So, Specimen- *Sacculina sp.*

IX. Scolopendra sp.

Systematic Position

Phylum- Arthropoda
Sub phylum- Uniremia
Class- Chilopoda

Upto Phylum same as *Limulus sp.*

1. Appendages uniramous, i.e. unbranched.
2. One pair of mandibles and one pair of antennae present.
3. Respiration by trachea; excretion by Malpighian tubule.

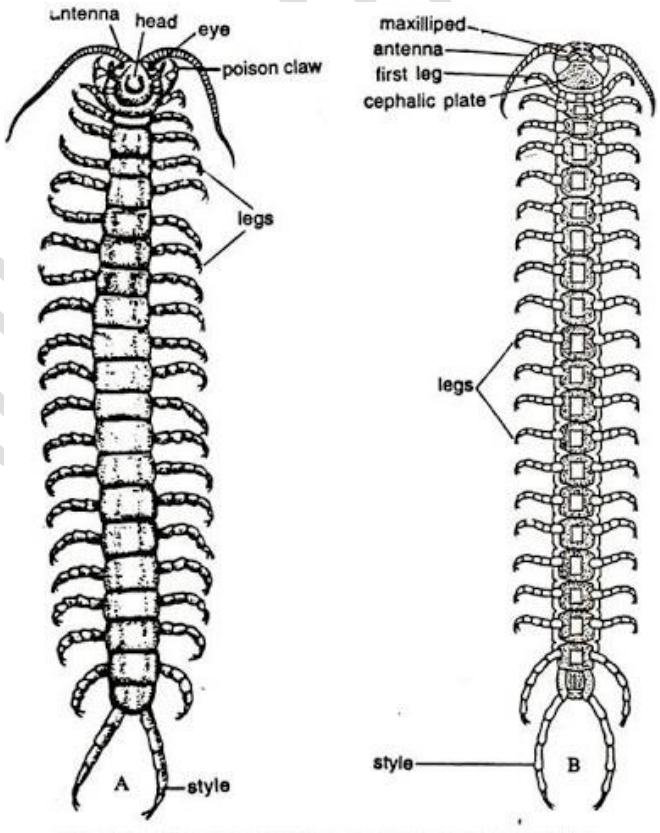
….So, Sub phylum Uniremia

1. Elongated dorsoventrally flattened body.
2. Presence of a pair of long filiform antennae, a pair of mandibles and two pairs of maxillae.
3. Trunk with many somites, each bearing one pair of legs.
4. The appendages of the first trunk segment modified into prehensile claw or pincer.

…..So Class Chilopoda

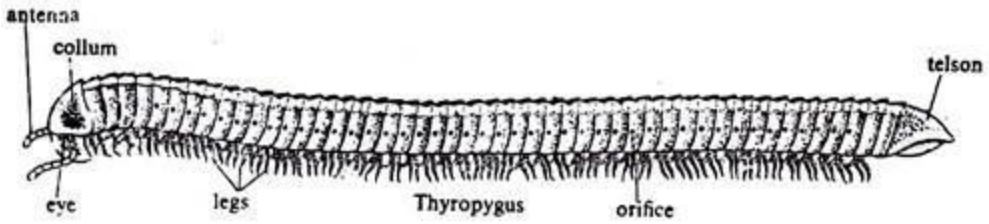
1. Body with a head and a trunk
2. Body 21 segmented.
3. Two eyes present on head.
4. Claw of first pair of trunk appendage with poison gland.
5. Each leg 7 segmented.
6. Anus is the last body segment.

….So, Specimen – *Scolopendra sp.*



A. Dorsal View, B. Ventral View

X. Julus sp.



Systematic Position

Phylum- Arthropoda
Sub phylum- Uniremia
Class- Diplopoda

Upto sub phylum same as *Scolopendra sp.*

1. Tube like body with distinct head and trunk.
2. Presence of double trunk segments or diplosegments.
3. Each diplosegment bears two pairs of legs.
4. Antenaae club shaped and seven segmented.
5. Eye simple; arranged in a group or patch (ocellaria) on each side of the head.
6. A pair of mandible and maxillae present.
7. The first trunk segment is apodous (without feet).

……So, Class- Diplopoda

1. Body divisible into head, thorax & abdomen.
2. Antennae small & 7 jointed.
3. Thorax 4 segmented.
4. Stink gland present.

…….So, Specimen *Julus sp.*

XI. Bombyx Sp.

Phylum- Arthropoda
Sub phylum- Uniremia
Class – Insecta

Upto sub phylum same as *Scolopendra sp.*

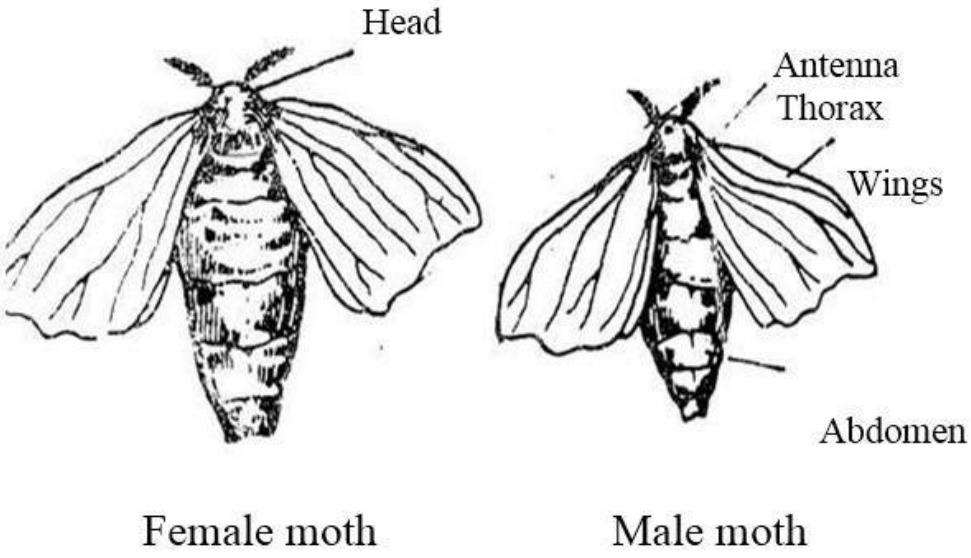
1. Three pairs of thoracic appendages/legs present.
2. Head with a pair of antennae, a pair of mandible and two pairs of maxillae.
3. Body divisible into head, thorax & abdomen.

…. So, Class Insecta

1. Creamy white colour moth.

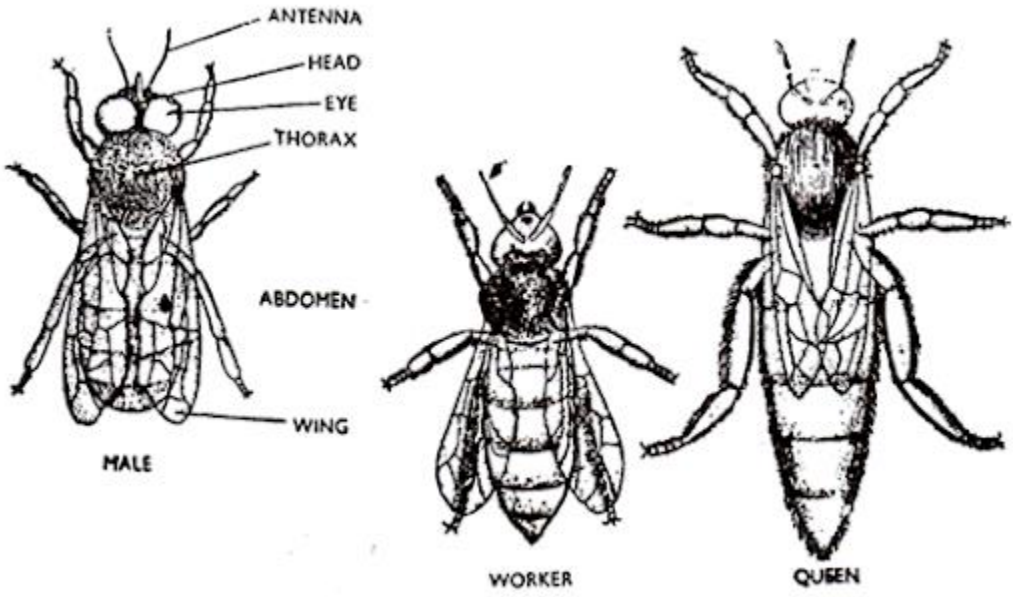
2. Two pairs of wings present.
3. Body stout.
4. Antennae short and feathery.
5. Proboscis absent.

So, Specimen - adult *Bombyx sp.*



XII. **Honey bee**

Systematic position & character upto class is same as *Bombyx* sp..

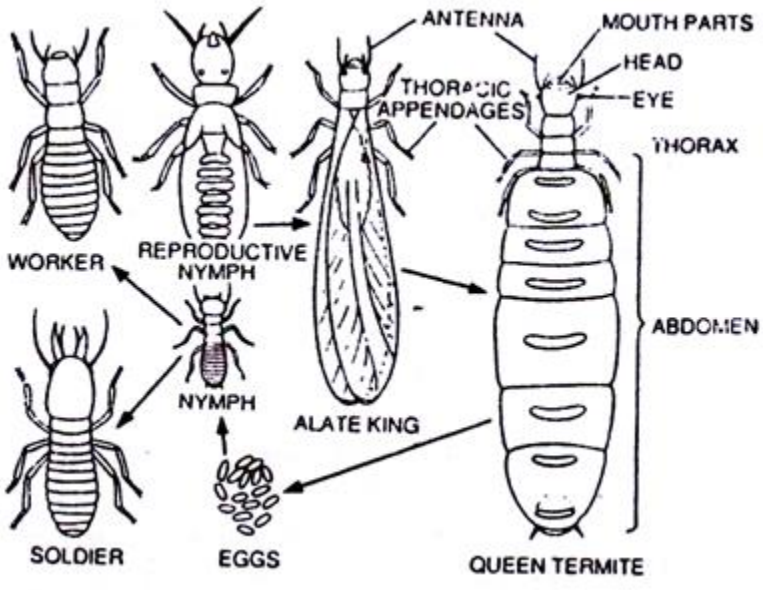


1. Head triangular with 3 ocelli at middle.
2. Antennae short, many jointed.
3. Mouth parts rasping 7 licking type.
4. Abdominal segment 6 in worker & 7 in drone & queen.
5. Pollen brushes seen.

So, Specimen – Honey bee

XIII. Termites

Systematic position & character upto class is same as *Bombyx* sp.



Termite Queen

- It is sexually mature female of colony.
- **Body-** elongated and cylindrical,divided into head, thorax, abdomen.

- **Head** and **thorax** are comparatively small.
- **Abdomen** enormously swollen;has a large no. of fertilised eggs.
- **Mouth parts** biting type

Worker

- Small white wingless form
- Head directed downwards
- Jaw small but broad
- Mandible well developed

Soldier

- Head large
- Jaw pointed

References

Chaki, K.K., Kundu, G. and Sarkar, S. 2005. Introduction to General Zoology. New central Book Agency

Ghose, K.C. and Manna, B. 2009. Practical Zoology. 3rd. ed. New central Book Agency

Parker, T.J. and Haswell, W.A. 1972. Text book of zoology Invertebrates, edited by Marshall, A.J. and Williams, W.D. 7th. ed. CBS Publishers & Distributors

Poddar, T., Mukhopadhyay, S. and Das, S.K. 2015. An Advanced Laboratory Manual of Zoology. Trinity.

Sinha, J., Chatterjee, A. K. and Chattopadhyay, P. 2010. Advanced practical Zoology. Books & Allied (P) ltd.