

## Insect morphology and systematics bits

### Matching

- |                 |     |                 |
|-----------------|-----|-----------------|
| 1. Lepidoptera  | (d) | a) termites     |
| 2. Plecoptera   | (c) | b) web spinners |
| 3. Isoptera     | (a) | c) stoneflies   |
| 4. Embioptera   | (b) | d) butterflies  |
| 5. Thysanura    | (h) | e) cockroach    |
| 6. Coleoptera   | (j) | f) thrips       |
| 7. Hemiptera    | (i) | g) antlion      |
| 8. Thysanoptera | (f) | h) silverfish   |
| 9. Neuroptera   | (g) | i) bugs         |
| 10. Dictyoptera | (e) | j) beetles      |

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|-----------------|-----|----------------------|
| 1. Clavate      | (d) | a) grasshopper       |
| 2. Plecoptera   | (c) | b) honeybees         |
| 3. Isoptera     | (e) | c) stoneflies        |
| 4. Geniculate   | (b) | d) butterflies       |
| 5. Filiform     | (a) | e) termites          |
| 6. Lamellate    | (j) | f) thrips            |
| 7. Hemiptera    | (i) | g) antlions          |
| 8. Thysanoptera | (f) | h) cockroach         |
| 9. Neuroptera   | (g) | i) bugs              |
| 10. Dictyoptera | (h) | j) rhinoceros beetle |

### Fill in the blanks:

1. Antennae are appendages of second head segment.
2. Antennae are highly reduced in larva
3. Antennae are absent in insects belonging to the order Protura
4. The three regions of antennae are scape, pedicel and flagella
5. Johnston's organ is present in pedicel part of antennae.
6. Sub-division of tarsus is known as tarsomeres
7. Trochanter is the shortest segment of a leg.
8. A set of additional structures attached to the last tarsal segment are collectively known as pretarsus
9. Abdominal legs of a caterpillar are known as prolegs
10. Insects are otherwise called as hexapoda based on the number of legs.
11. Hook like structures present on planta are known as crochets
12. Tarsus is subdivided into 2-5 subdivisions.

### Fill in the blanks

1. Mouth parts studied in the grasshopper are of biting and chewing type.
2. Glossa and paraglossa jointly called as ligula
3. Maxillary palpus is attached to palpifer whereas labial palpus is attached to palpiger
4. Mandibles articulate with head capsule by means of condyle and ginglymus
5. labium is the lower lip.
6. In chewing and biting type of mouth parts labialpalp act as sensory organs.
7. The ducts from salivary glands open on or near hypopharynx
8. maxillae are the accessory jaws aiding the mandibles in holding the food.
9. Right mandible is rudimentary in rasping and sucking type of mouth parts.
10. Mouth cone is present in rasping and sucking type of mouth parts.

### Fill in the blanks

1. Haustellum ends with a pair of labellum
2. The spoon shaped structure at the end of the elongated glossa in chewing and lapping mouthparts is termed as flabellum
3. galea of maxillae is elongated to form proboscis in butterflies.
4. Mandibles are absent in sponging and siphoning type of mouth parts.

5. Pseudotracheae are present in sponging type of mouth parts.

**Fill in the blanks:**

1. Wings are attached to **meso** and **meta** thoracic region.
2. The three margins of a typical wing are **coastal**, **apical** and **anal margins**
3. Arrangement of veins on the wing surface is known as **wing venation**
4. The surface of the wing is divided into two areas namely **remigium** and **vanal area**

**Fill in the blanks:**

Mention the type of larva / pupa based on the following characters.

1. Cephalic appendages are rudimentary without abdominal segmentation in **protopod larva**
2. The appendages of the pupa are firmly pressed against its body **obtect**
3. Trunk appendages are completely absent with well developed head in **Apodous larva**
4. Both thoracic and abdominal legs present **polypod larva**
5. A degenerate larva **protopod larva**
6. Body is bent in "C" shape **scarabaei form**
7. Active larvae with thoracic legs only **campodaeiform**
8. Pupa is covered by puparium in **chrysalis pupa**
9. First two pairs of prolegs reduced **semilooper**
10. A small horn like projection on dorsal side of 8<sup>th</sup> abdominal segment **sphingid larvae**

**Fill in the blanks**

1. Class insecta is divided in to **apterygota** and **pterygota** sub classes
2. The name class Insecta was coined by **Linnaeus** in 1758
3. In class Insecta, the sub family name ends with **inae**
4. Paleopteran orders are characterized by the absence of **wing folding** mechanism
5. Males with upturned abdomen is observed **orthoptera** group of insect orders
6. In class Insecta, the names of the orders are mostly based on **wing** character.
7. **femuro-alary** type of stridulatory organs are present in the family Acrididae
8. In short horned grasshoppers, tympanal organs are situated on **first abdominal segment**
9. In Acrididae, the forelegs are modified for **walking**
10. Ootheca is present in **dictyoptera** order
11. In cockroaches Ocelli are called as **fenestrae**
12. In preying mantids **raptorial** type of fore leg is present

**Fill in the Balnks:**

1. The characteristic termite organ is **frontal gland**
2. The obesity in fertilized termite queen is known as **physogastric condition**
3. Frontal gland is well developed in **nasuate type** of soldiers.
4. Order Thysanoptera is otherwise known as **physopoda** based on leg character.
5. Thrips possess **assymetrical** type of mouth parts
6. Fringed wings are present in **thysonoptera** order.

**Fill in the Blanks**

1. Order Hemiptera is divided in to **heteroptera** and **homoptera** sub orders.
2. Odoriferous glands are present in sub order of **heteroptera** Hemiptera
3. Wax glands are present in sub order of **homoptera** Hemiptera
4. In Heteroptera, five segmented antennae are present in **pentatomidae** family
5. Leaf footed bugs belong to **coreidae** the family
6. Presence of one or two rows of small spine on hind tibia is characteristic feature of **Cicadellidae** family of sub order Homoptera.
7. In Homoptera, presence of large mobile apical spur on hind tibia is the characteristic feature **Of delphacidae** family.
8. Aphids possess **cornicles** a pair of on the dorsum of 5<sup>th</sup> and 6<sup>th</sup> abdominal segments.
9. Presence of Vasiform orifice is the characteristic feature of **aleurodoidae**

**Fill in the blanks:**

1. In siphoning type of mouth parts long coiled proboscis is formed by **galea of maxillae**
2. The butterfly pupa is called as **chrysalis**
3. Fruit sucking moths cause damage in their **adult** stage to the ripened citrus fruits
4. Labial palpi are upcurved **gelechidae** in family
5. Labial palpi project forward as snout in **pyralidae** family

6. The larvae are cutworms and nocturnal in noctuidae family

**Fill in the blanks:**

1. In Coleoptera, the variation in the number of tarsal segments with in the same insect is represented by tarsal formulae
2. The phytophagous insect in Coccinellidae is epilachna (S.N.)
3. The grubs of tree borers with powerful mandibles while adults are with long curved antennae in cerambicidae family
4. Weevils belong to the family curculionidae
5. C- shaped larva is characteristic of scarabidae family

**Fill in the blanks:**

1. Acuteness of vision is the characteristic feature of hymenoptera order
2. In Hymenoptera, abdomen is divided in to propodeum, pedicel and gaster
3. In Hymenoptera, the second abdominal segment is known as pedicel
4. In Hymenoptera, the first abdominal segment fused with meta thorax is known as propodeum
5. The phytophagous insects of Hymenoptera belong to tenthredinidae family
6. The total number of prolegs in the larvae of mustard saw fly are 6-8pairs
7. The Hymenopteran family exclusive of egg parasitoids is trichogrammatidae

**Fill in the blanks:**

1. In Diptera hind wings are known as halteres
2. The pupa of Diptera is known as coarctate
3. Paedogenesis is observed in cecidomyiidae family of Diptera
4. Flattened ovipositor is characteristic of tephritidae family
5. Leaf miners belong to the family agromyziidae

1. Who published the book 'Indian ants' rothney

2. 10<sup>th</sup> edition of 'systema naturae' was published in the year 1758
3. Who was appointed as first entomologist to govt of India niceville
4. Locust warning organization was established in the year 1939
5. Expand and write the location for NCIPM
6. Expand and write the location for NBAII
7. 'Some south Indian insects' book was written by T.b fletcher
8. List out the any five structural characters
9. Canthardin is produced by blister beetle insect
10. Two pairs of antennae is present in class crustacean
11. Chitin is absent in epicuticle layer of the cuticle
12. Cement layer is secreted by dermal glands
13. rubber like elastic protein is called reslin
14. Spur is multicellular in origin
15. Give an example for opisthognathous type of head bugs
16. Study of arrangement of setae is called chetotaxy
17. Post occipital suture is also known as real suture
18. Ecdysial suture is also known as line of weakness
19. Antennae is located in which segment of head 2nd
20. Adult diapause is found in mango nut weevil
21. In case of thrips sense cones are located at 3<sup>rd</sup> or 4<sup>th</sup> antennal segment
22. Presence of osmeteria is characteristic feature of lymantridae family
23. Frontal sac /ptilinum is found in diptera order
24. Group of regenerative cells are called as nidhi

