

General Entomology

Lecture 3

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Lecture Topics

Insects Body parts

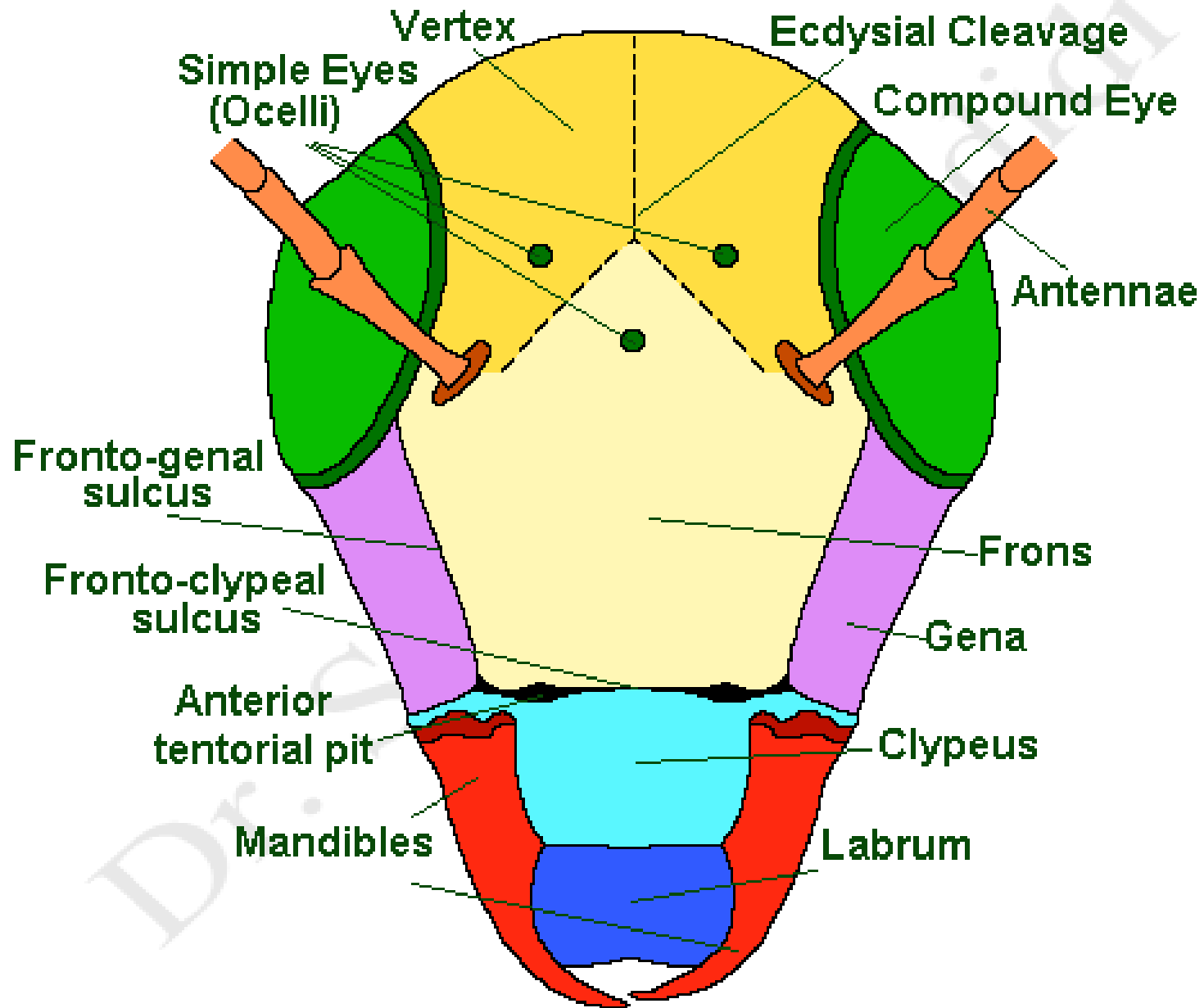
I. Head

- Mouthparts
- Mouthpart types
- Antennae
- Eyes

Insects Head

- Known as head-capsule and it is insect's feeding and sensory center.
- It supports the eyes, antennae and jaws of the insect.
- The top of the head is the 'vertex'; the sides of the head are known as the 'gena'.
- The upper-mid portion of an insects face (bellow the vertex) is the 'frons'.
- Below the frons is the 'clypeus' and below this is the 'labrum'.
- The 'labrum' is equivalent to the insect's upper lip and is generally moveable, it articulates with the clypeus .

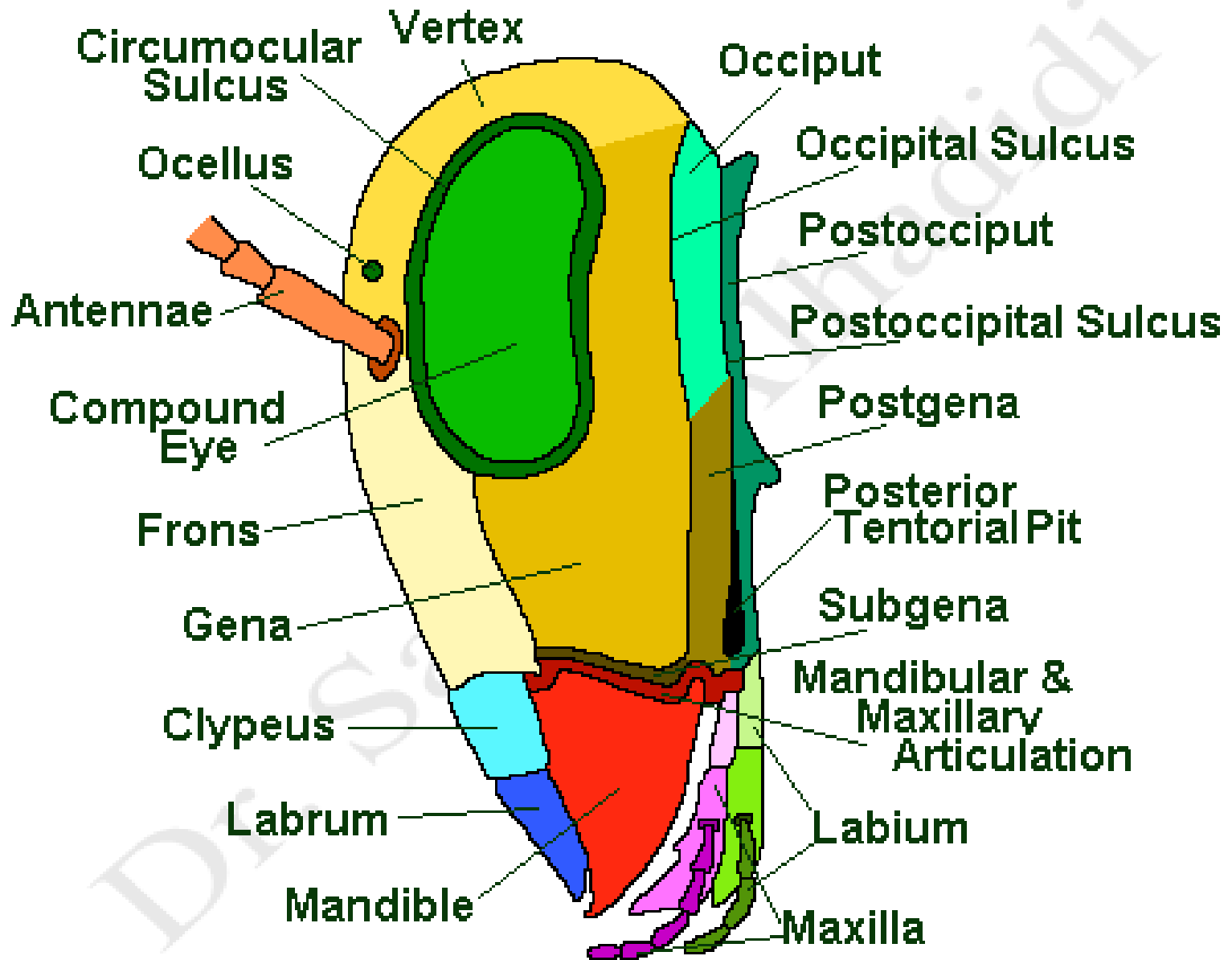
The Insect Head (Frontal)



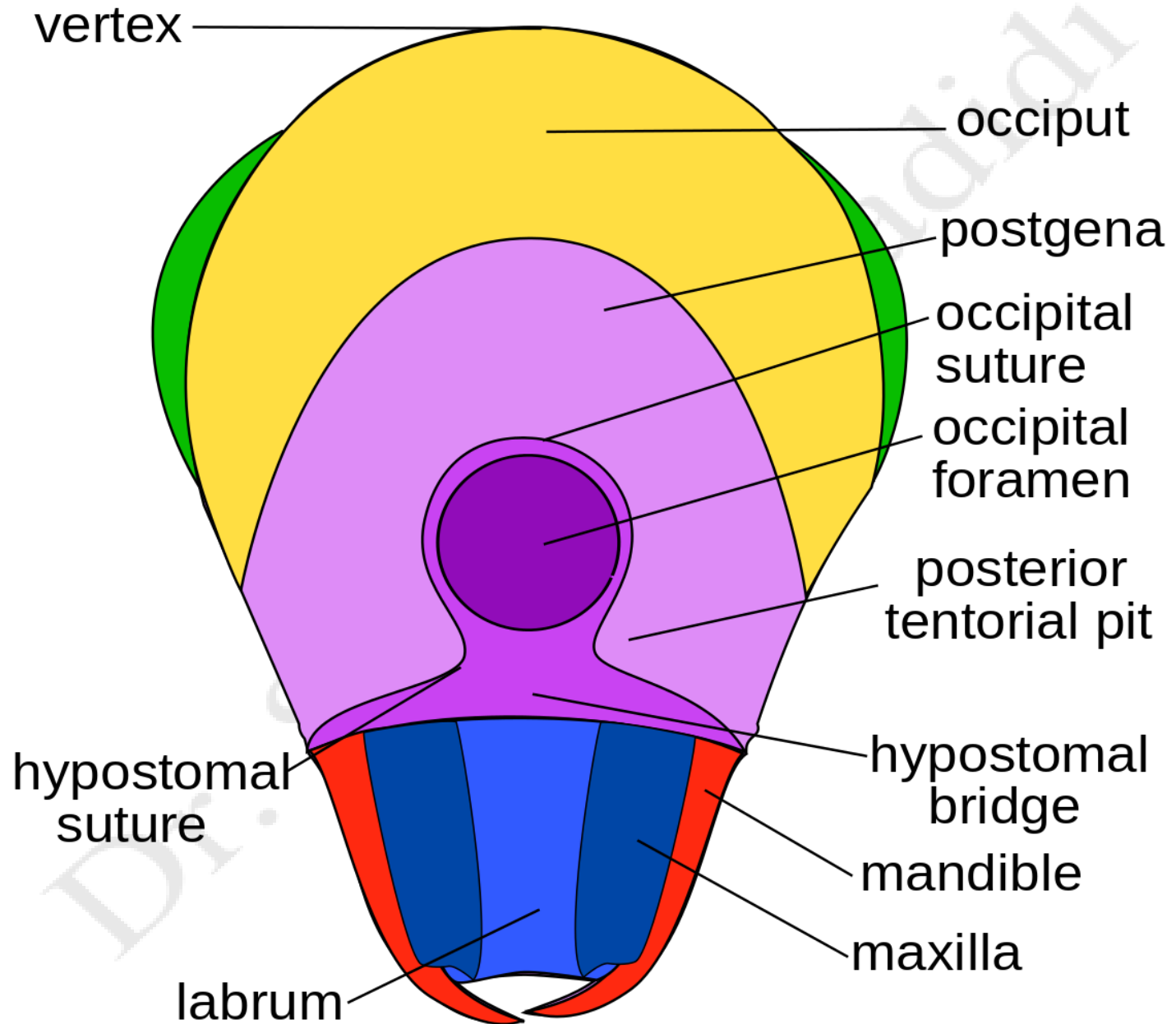
Insects Head

- To either side of 'labrum' may be seen the edges of the 'mandibles' in some insects some aspects of the 'maxillary' palps may extend.
- Ecdysial clavage = λ upside Y in the middle of the vertex
- 'Fronto-genal sulcus = between the frons and the gena .
- Fronto-clypeal sulcus = between the frons and the clypeus 'clypeo-labral suture'.

The Insect Head (Side View)



The insects head (back view)

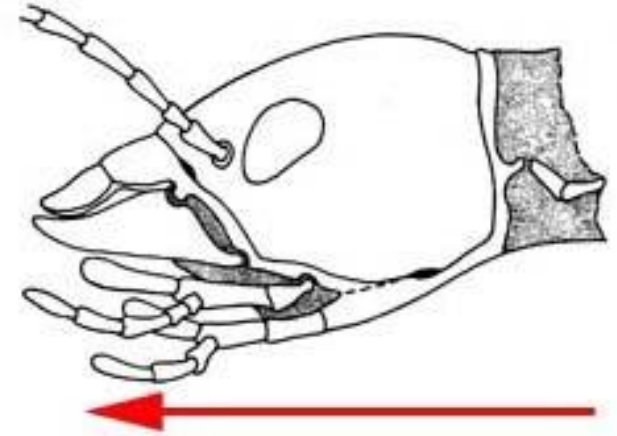


Orientation of insects head

There are three types of orientation.

1. Prognathous

- Also called coleopteroid type.
- Mouthparts are pointing forward.
- Mouthparts are anterior in position.
- Long axis is horizontal.
- Mostly carnivore insects have this type of orientation.
- Ex: earwigs, larval neuropterans, ground beetls and termite soldiers.



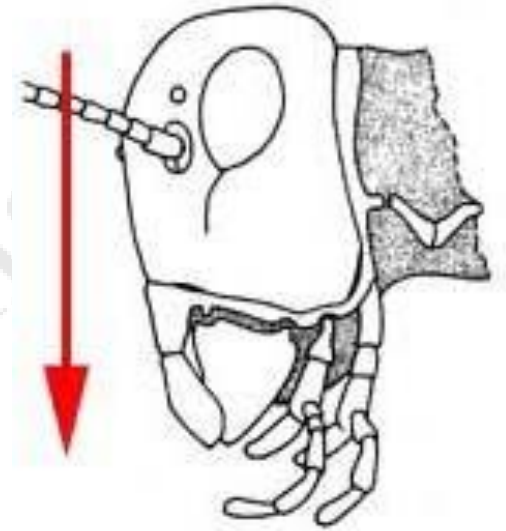
Violate ground beetle



Orientation of insects head

2. Hypognathous

- Also called orthopteroid type.
- Mouthparts are pointing downward.
- Mouthparts are ventral.
- Long axis is vertical.
- Mostly herbivore insects contain this type.
- Ex: Grasshopper, cockroaches and phytophagous beetles.



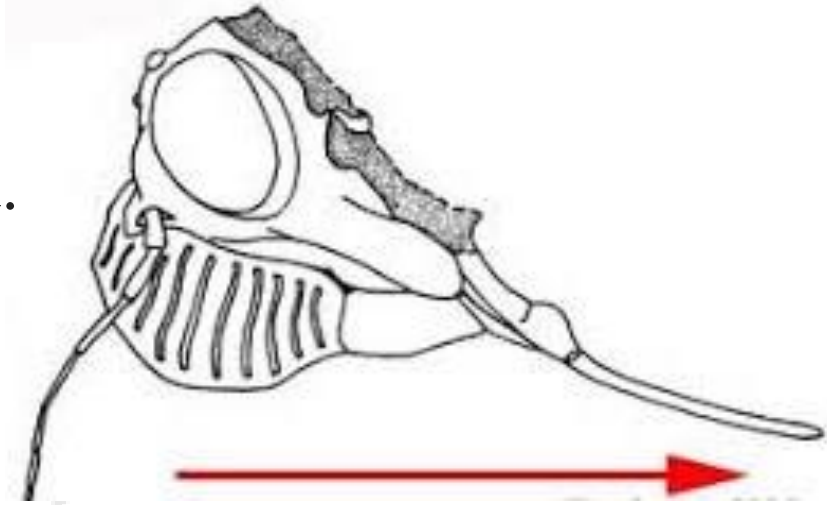
Grasshopper



Orientation of insects head

3. Opisthognathous

- Also called hemipteroid type.
- Mouthparts are pointing backward.
- Mouthparts are directed down between the fore legs.
- This is known as proboscis.
- Long axis is horizontal.
- Ex: Plant sucking bugs (Order: Hemiptera).



Aphid

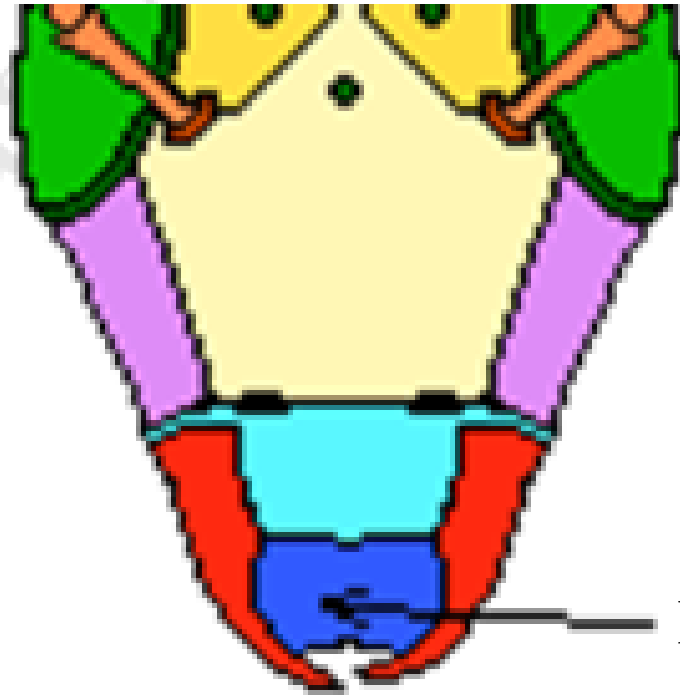


Insects Mouth parts

- Insects mouth consist of **5** parts
- **Labrum**, Mandibles, Maxillae, Labium, Hypopharynx or tongue.

1. **Labrum** = upper lip.

- A plate-like.
- Protecting other parts.
- Helps to contain the food.



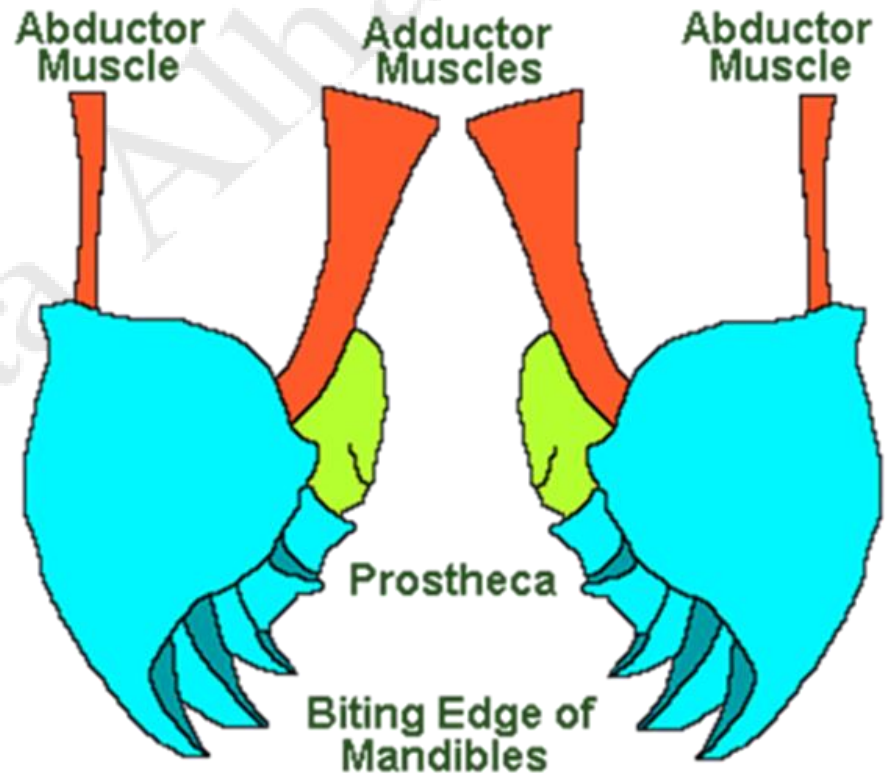
Labrum

Insects Mouth parts

3. Mandibles

- Pair of jaws.
- Crushing the food.
- They operate from side to side.

The Insect Mandibles

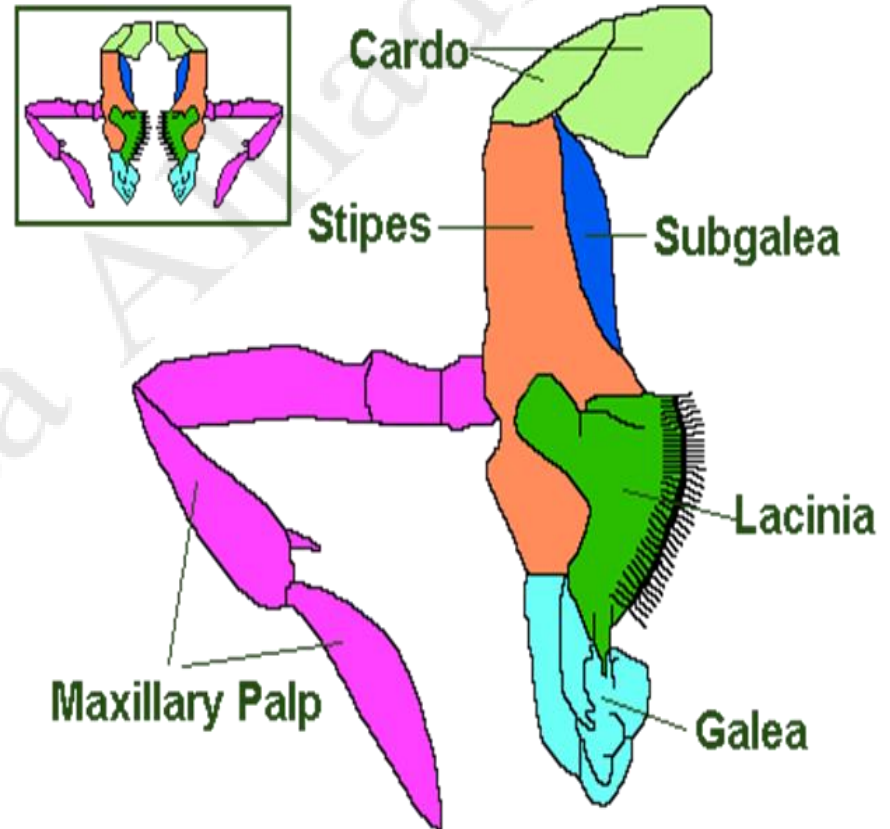


Insects Mouth parts

2. Maxillae

- A pair of appendages, divided in to five parts:
 - Cardo > articulates with the head.
 - Stipes > supports a sensory palp.
 - Galea, lacinia, and maxillary palp > act as fork and spoon to manipulate the food.

The Insect Maxillae (one side only)



Insects Mouth parts

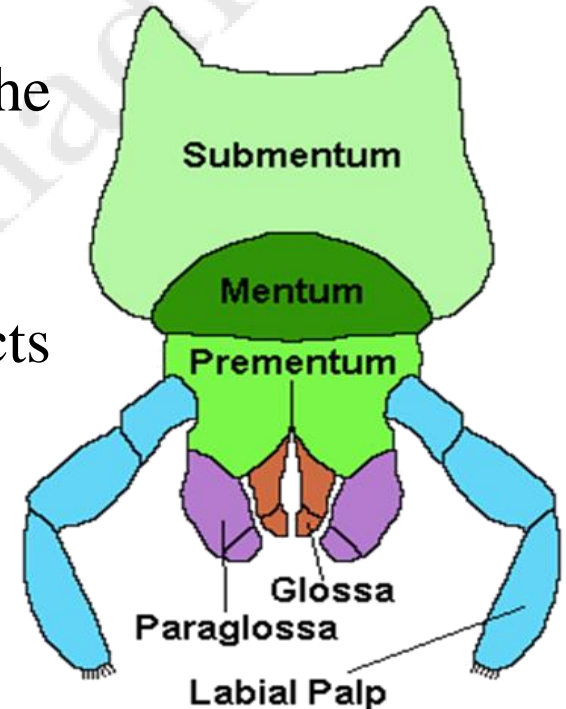
4. Labium

- Two appendages have fused together along the middle to form the labium.
- Serve as our lower lip for the insects (preventing food from falling).

5. Hypo-pharynx or tongue

- Has salivary ducts at its base, it located behind mandibles and between maxillae.
- Helps mix food and saliva.

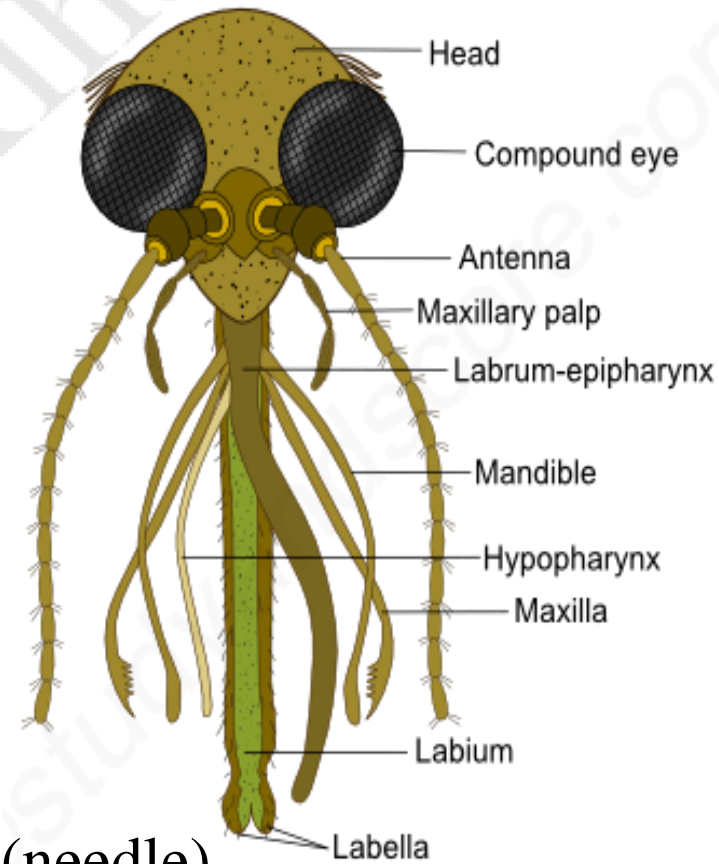
The Insect Labium



Types of Insects Mouth parts

1. PIERCING & SUCKING TYPE

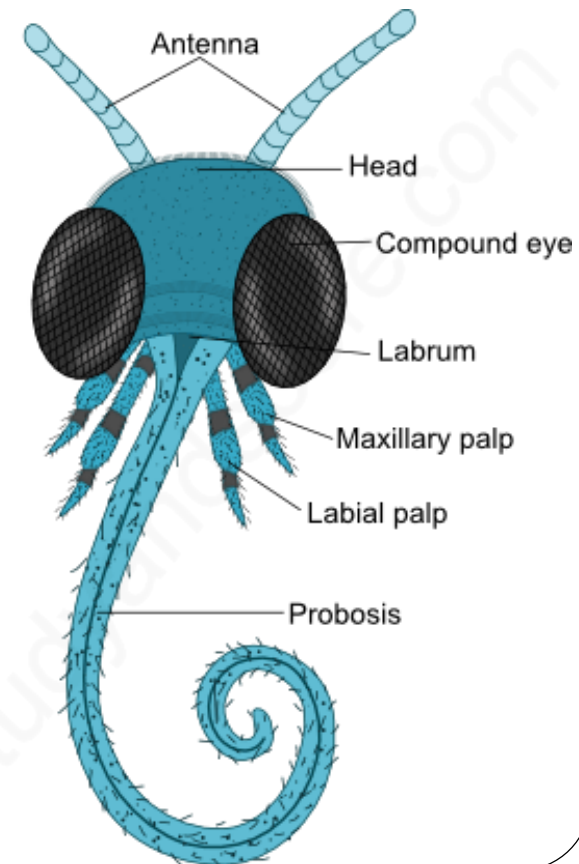
- For piercing animals or plants and suck blood or fluid.
- Found in mosquitoes, flies, bugs & lice.
- All pieces form a proboscis.
- Labium = sucking tube.
- Labrum = lid.
- Hypopharynx = release saliva.
- Maxillae and mandibles = pierce the skin (needle).



Types of Insects Mouth parts

2. SIPHONING TYPE

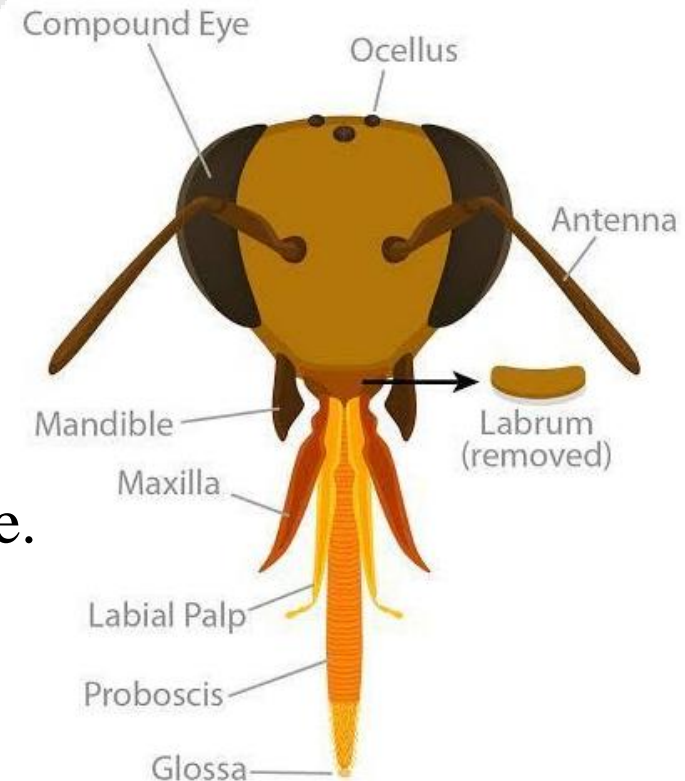
- For sucking nectar of flowers.
- Found in butterflies and moths.
- Galea of maxillae join to form the proboscis.
- Labrum forms the base of the proboscis.
- Mandibles are absent.
- Labium is reduced to pair of labial palps.



Types of Insects Mouth parts

3. CHEWING & LAPPING TYPE

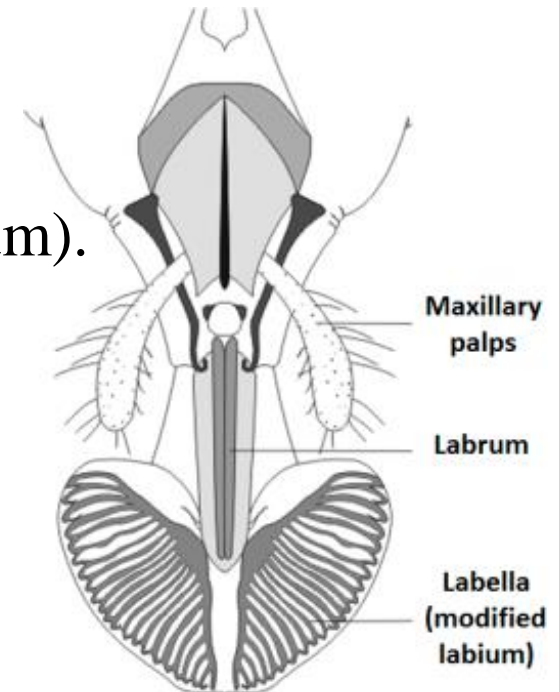
- For lapping up nectar and honey and chewing pollen and wax.
- Found in honeybees.
- Mandibles are developed for biting and chewing pollen and wax.
- Labrum forms the upper lip.
- labium + labial palps form a lapping tongue.
- Maxillae and maxillary palps are reduced.



Types of Insects Mouth parts

4. SPONGING TYPE

- For feeding on liquid food only.
- Found in houseflies.
- Proboscis = basal rostrum + apical haustellum.
- Proboscis = maxillae + labium.
- Labium forms a broad bilobed sponging (labellum).
- Labrum has been reduced.
- Mandibles are absent in flies.



Usfel websites

<https://www.earthlife.net/insects/anat-head.html>

https://projects.ncsu.edu/cals/course/ent425/library/tutorials/external_anatomy/head.html

<https://www.slideshare.net/satyasrin6/insect-head>

<https://feener.biology.utah.edu/courses/5445/Lecture/Bio5445%20Lecture%202010.pdf>

THINGS CAN BE
BETTER THAN
BEEFORE.



Dr. Sanaa