

LAB; NO. 4

**The modifications of
insects mouth parts**

MOUTHPARTS

- ✘ The second appendages of head developed during embryonic period, from third or four segments of head.

In each insect the mouth parts compose of 5 segments

1. Labrum
2. Labium
3. Mandibles
4. Maxillae
5. Hypopharynx

MOUTHPARTS

- ✘ The **labrum** is a simple fused sclerite, often called the upper lip, and moves longitudinal
- ✘ **Mandibles**, or **jaws**, are highly sclerotized paired structures that move at right angles to the body. They are used for biting, chewing and severing food.
- ✘ The **maxillae** are paired structures that can move at right angles to the body & possess segmented palps.
- ✘ The **labium** (often called the lower lip), is a fused structure that moves longitudinally and possesses a pair of segmented palps.

MOUTHPARTS

- ✘ Mouthparts vary greatly among insects of different orders but there are two main functional groups:
- ✘ **Mandibulate** and **haustellate**. Shown above and below are mandibulate (chewing) mouthparts. Haustellate mouthparts can be further classified as piercing-sucking, sponging, and siphoning.

TYPES OF MOUTHPARTS

1-Biting & chewing M. P.

mouthparts are used for biting and grinding solid foods .

EX: **Dragonflies** and **damselflies** (Order: Odonata)

Termites (Order: Isoptera)

adult **lacewings** (Order: Neuroptera)

Beetles (Order: Coleoptera)

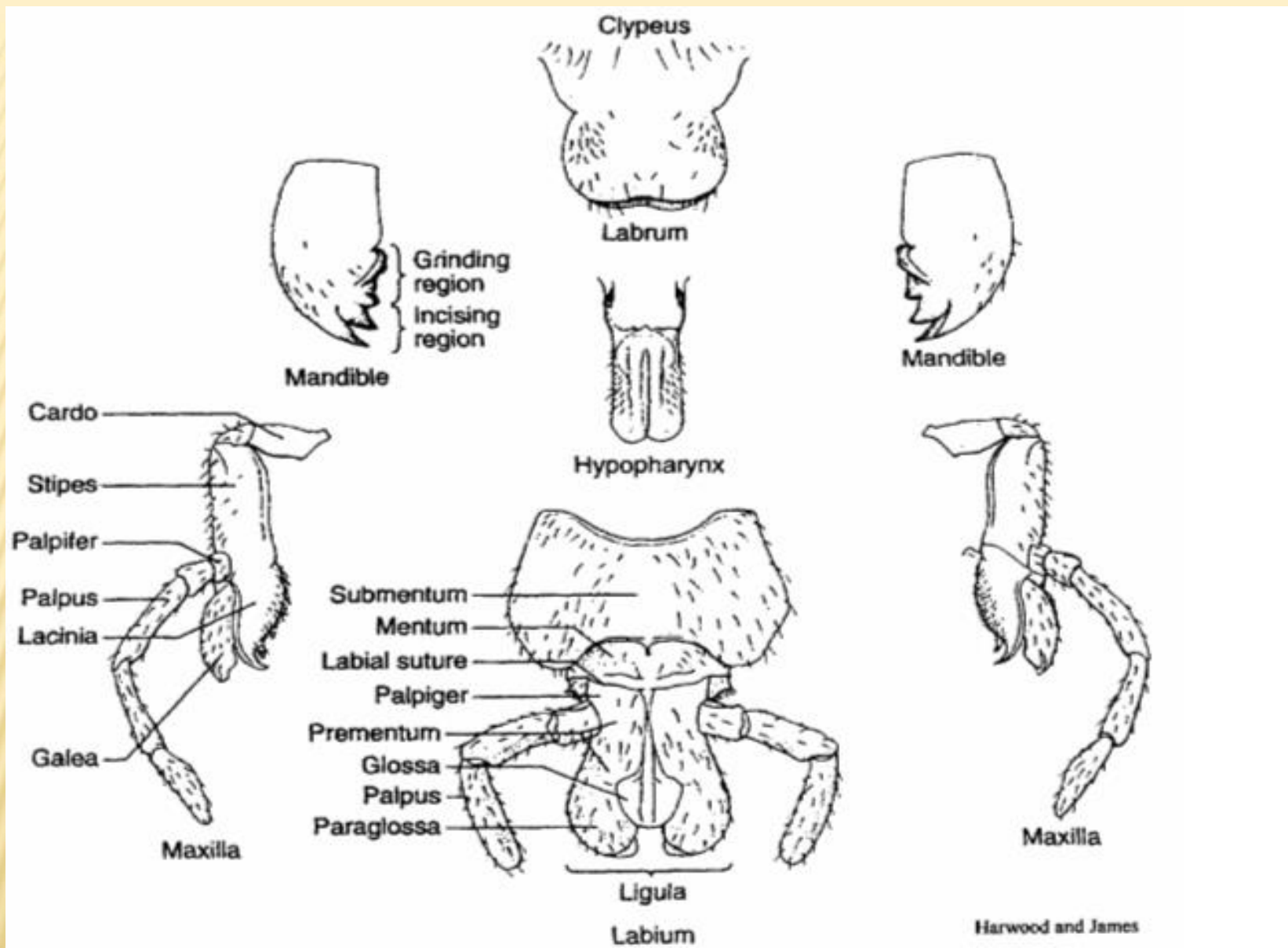
Ants (Order: Hymenoptera)

cockroaches (Order: Blattaria)

Grasshoppers, crickets and katydids (Order: Orthoptera)

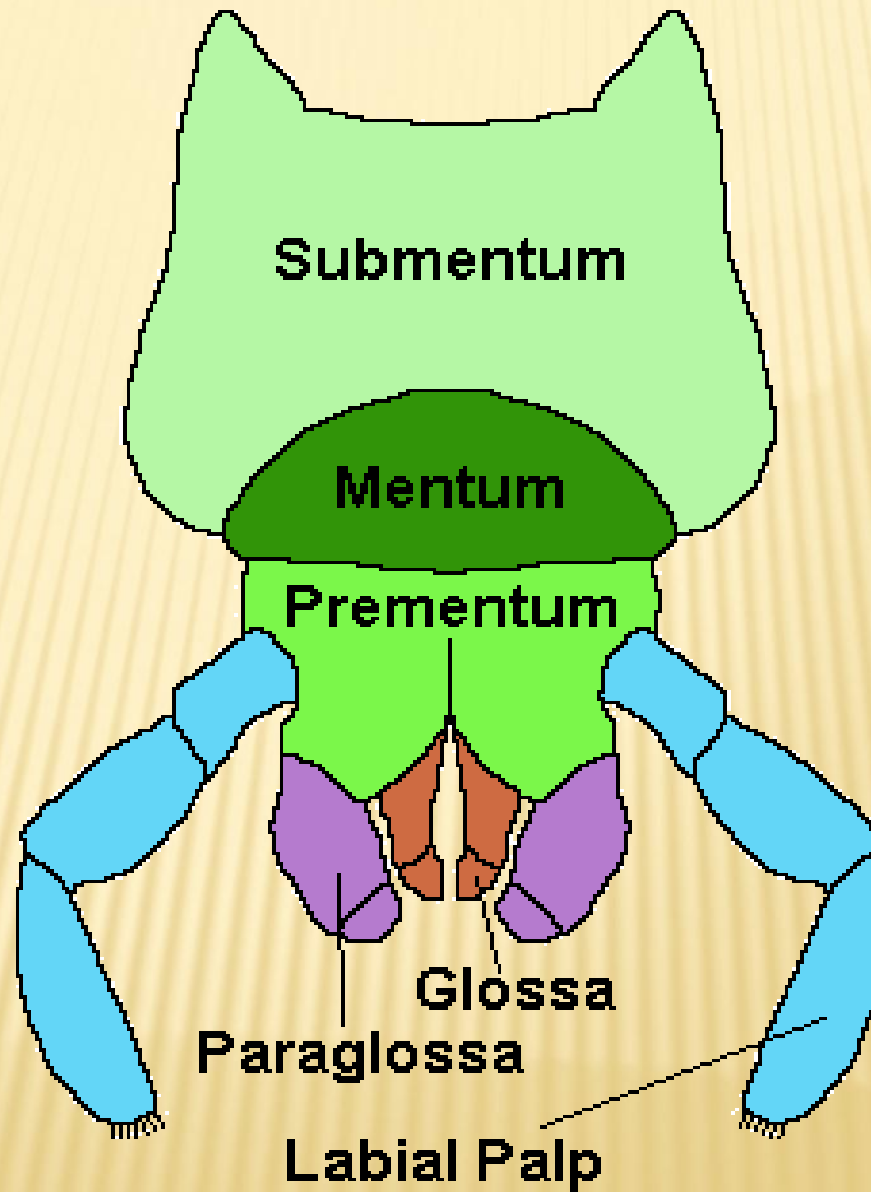
Caterpillars (Order: Lepidoptera).

Adult Lepidoptera have siphoning mouthparts.

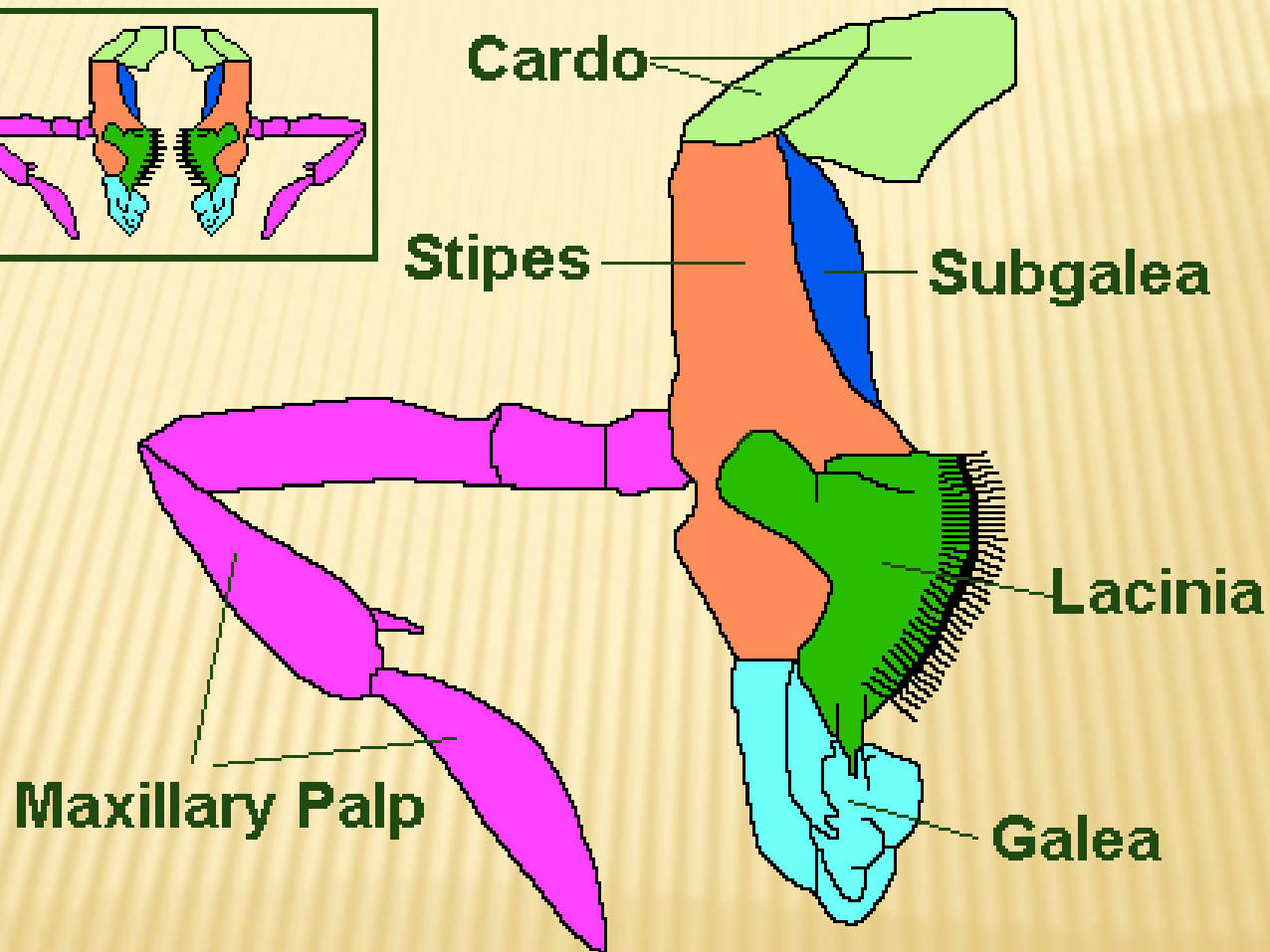
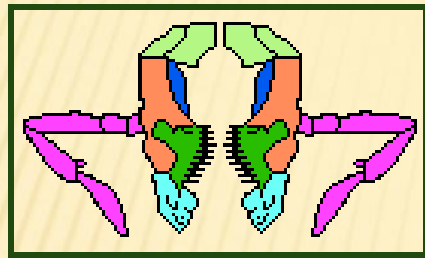


Chewing M. P.

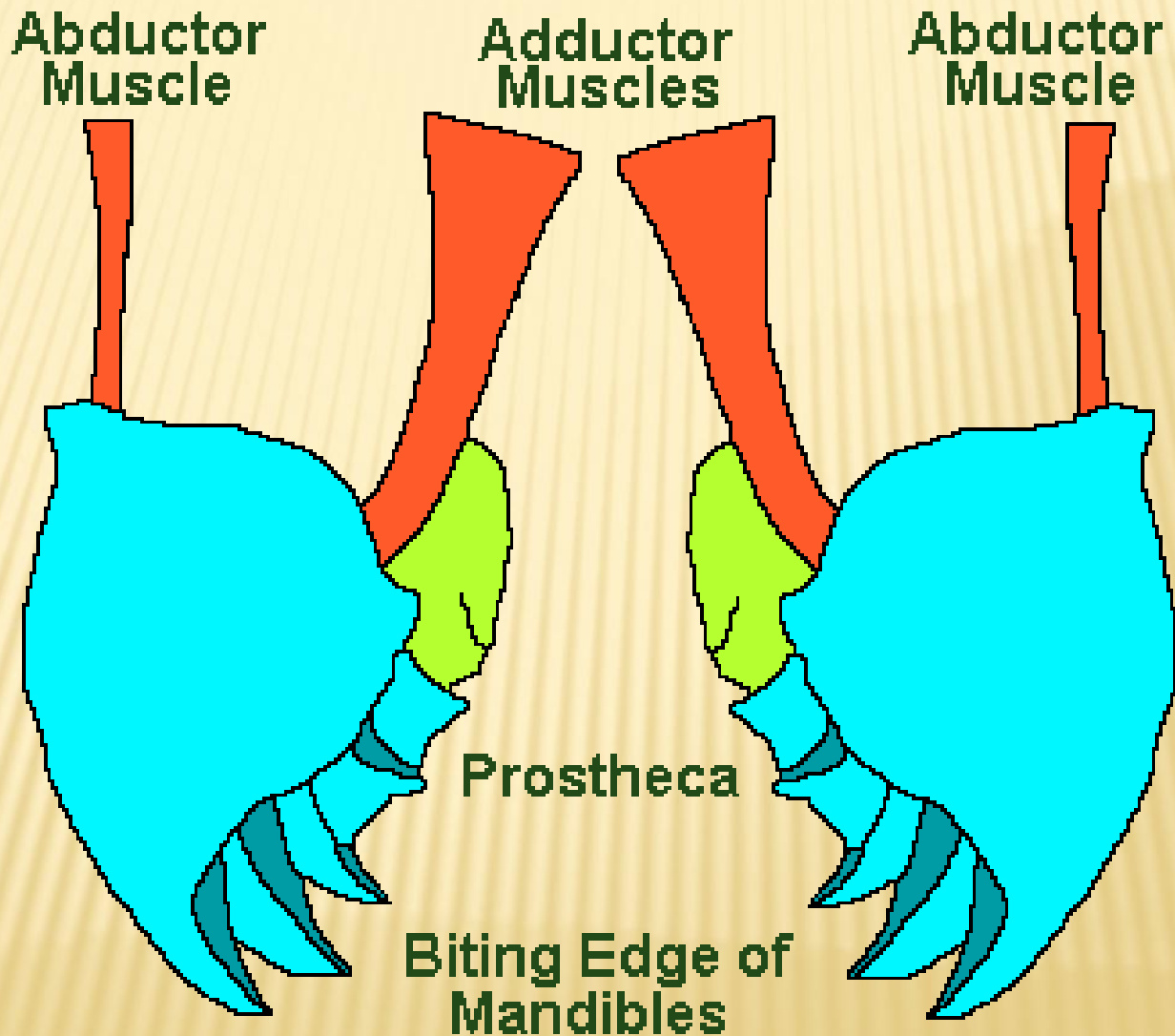
The Insect Labium



The Insect Maxillae (one side only)



The Insect Mandibles





Chewing M. P.



Ant (chewing M. P.)



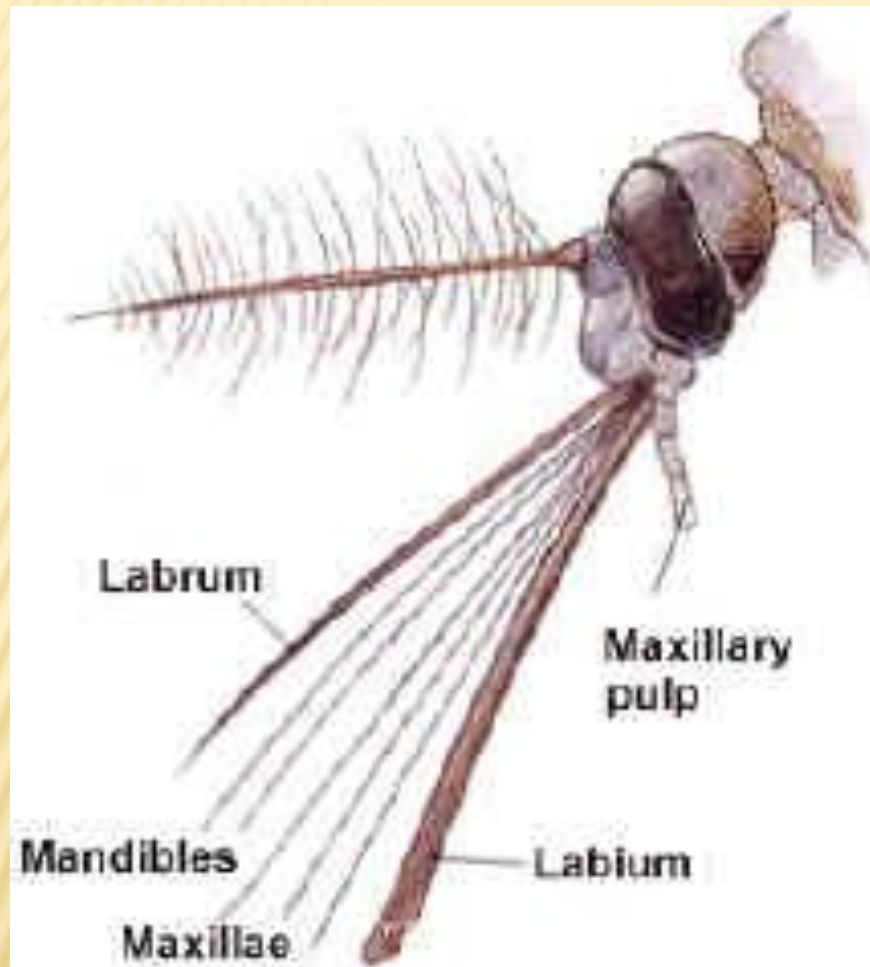
Termite(chewing M. p.)

HAUSTELLATE

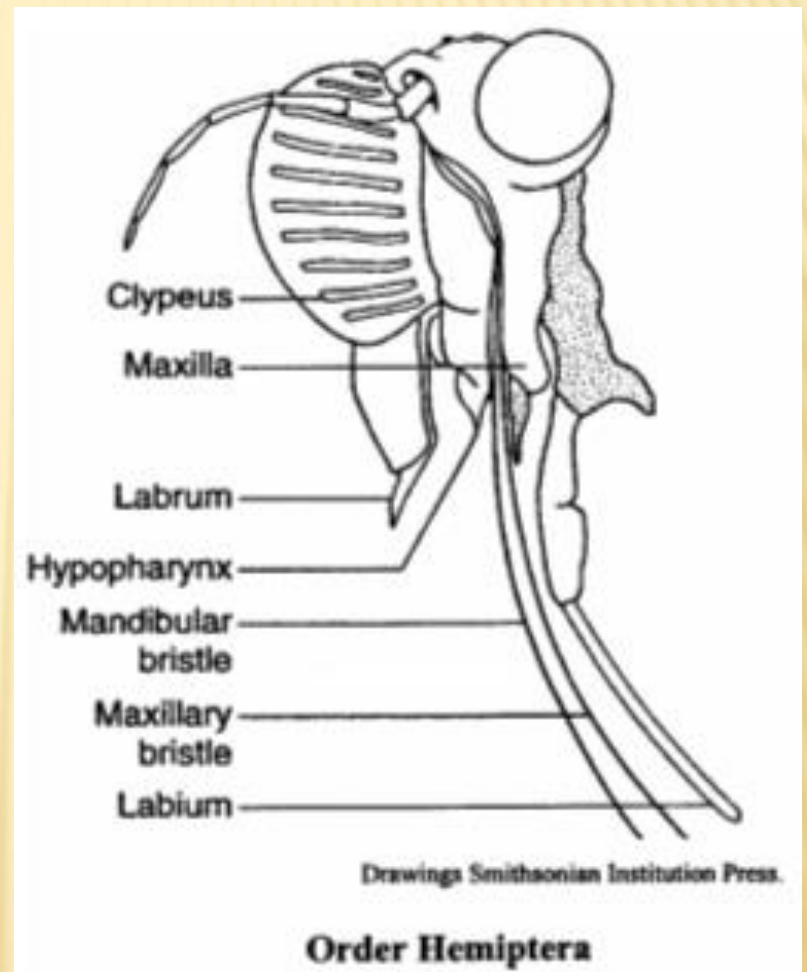
Haustellate mouthparts are primarily used for sucking liquids and can be divided into two subgroups: those that possess stylets and those that do not.

2-PIERCING & SUCKING M.P.

- ✘ **Stylets** are needle-like projections used to penetrate plant and animal tissue. The modified mandibles, maxilla, and hypopharynx form the stylets and the feeding tube.
- ✘ After piercing solid tissue, insects use the modified mouthparts to suck liquids from the host by hypopharynx and labrum.
- ✘ For example: Flea and Lice



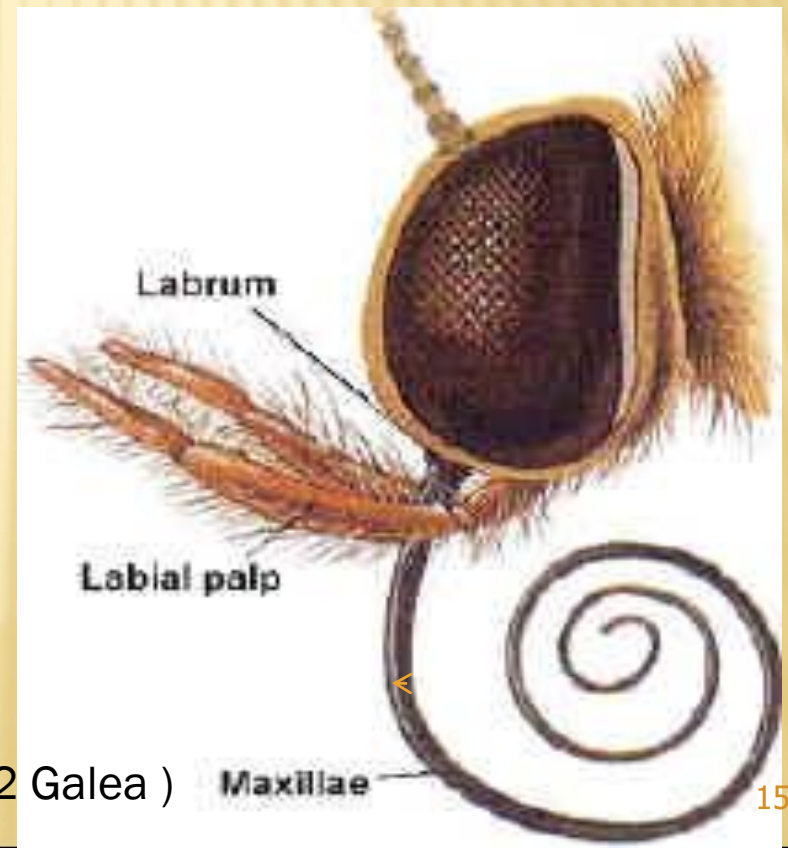
Mosquito head



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- ✘ Why insects feed on plant differ from insects feed on animal?

3- SIPHONING (SUCKING) M. P.

Siphoning mouthparts lack stylets and are used to suck liquids. **Examples:** Butterflies, moths (order Lepidoptera),

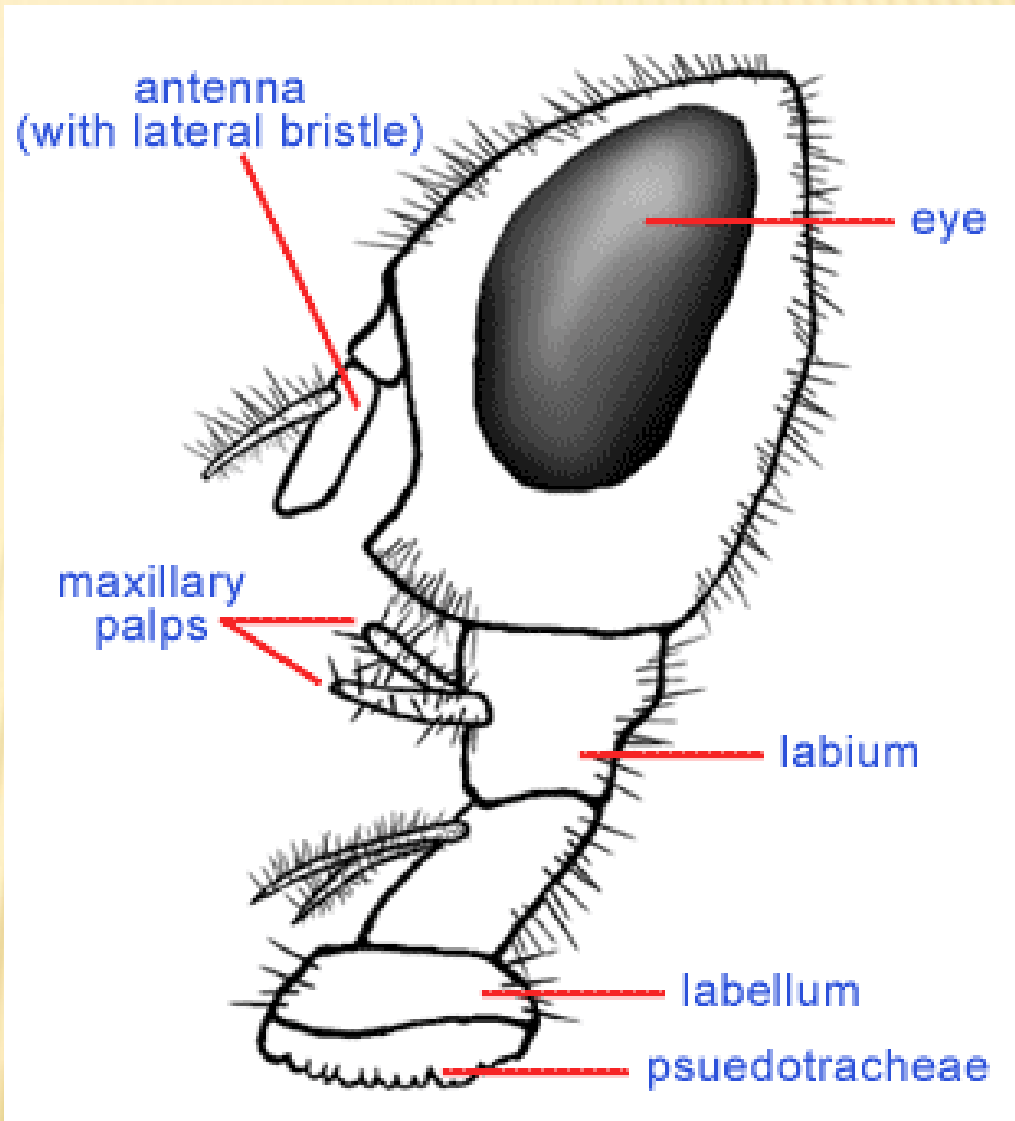
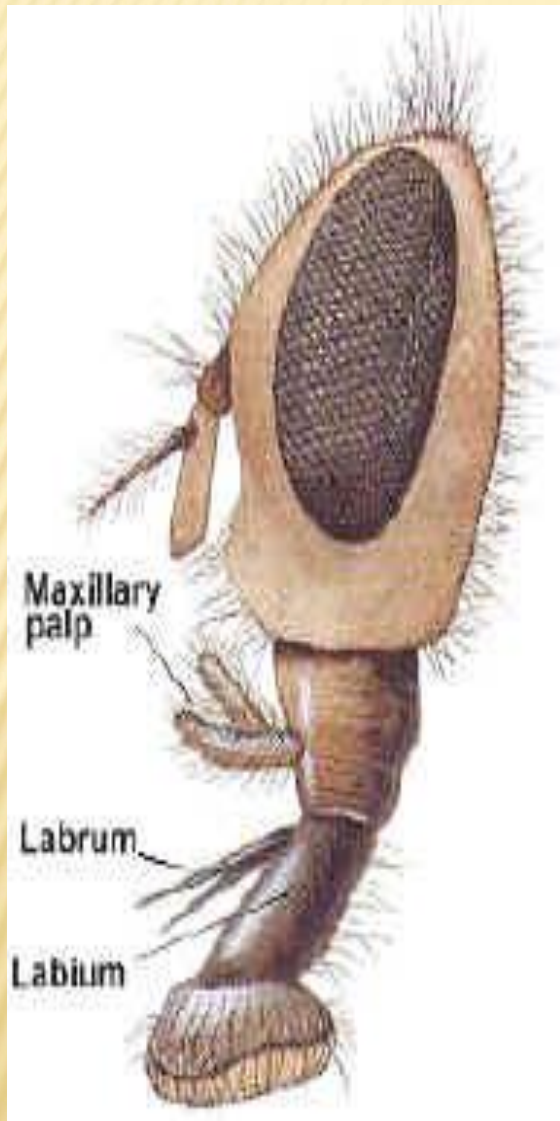


(2 Galea)

Maxillae

4-SPONGING OR LAPPING M. P.

Sponging mouthparts are used to sponge and suck liquids. Examples: House flies and blow flies (order Diptera)



House fly head



House fly, *Musca domestica*,



Green bottle fly (blow fly),
Phaenicia sericata,

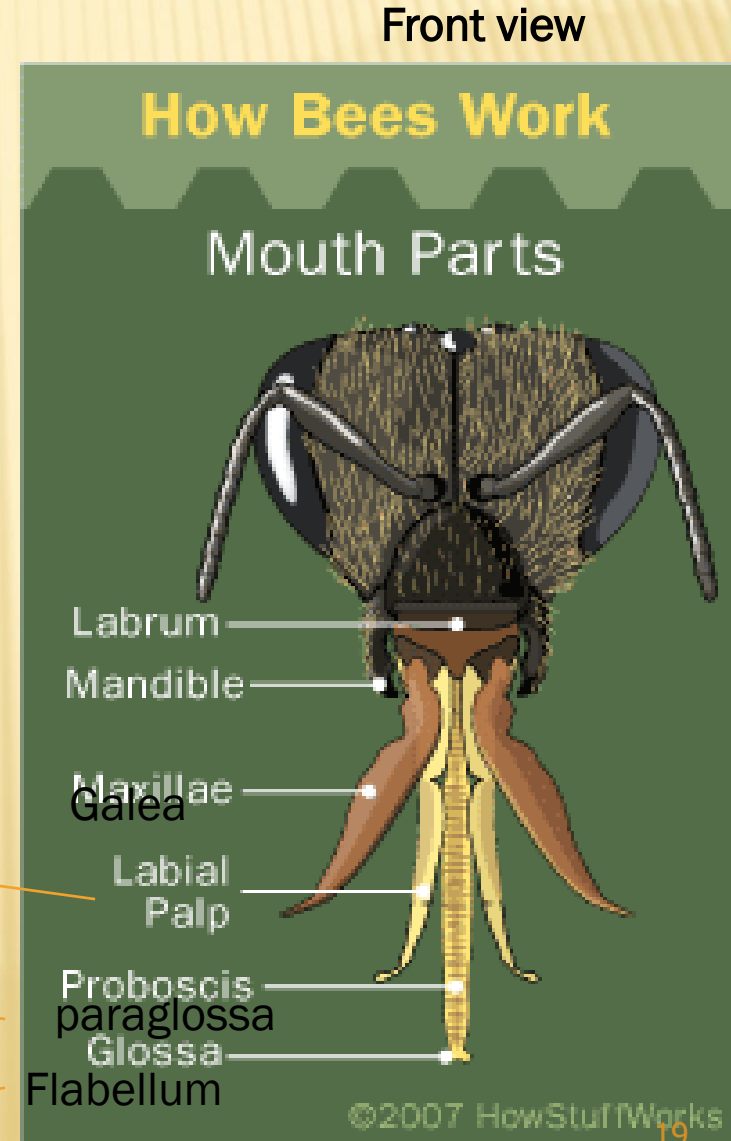
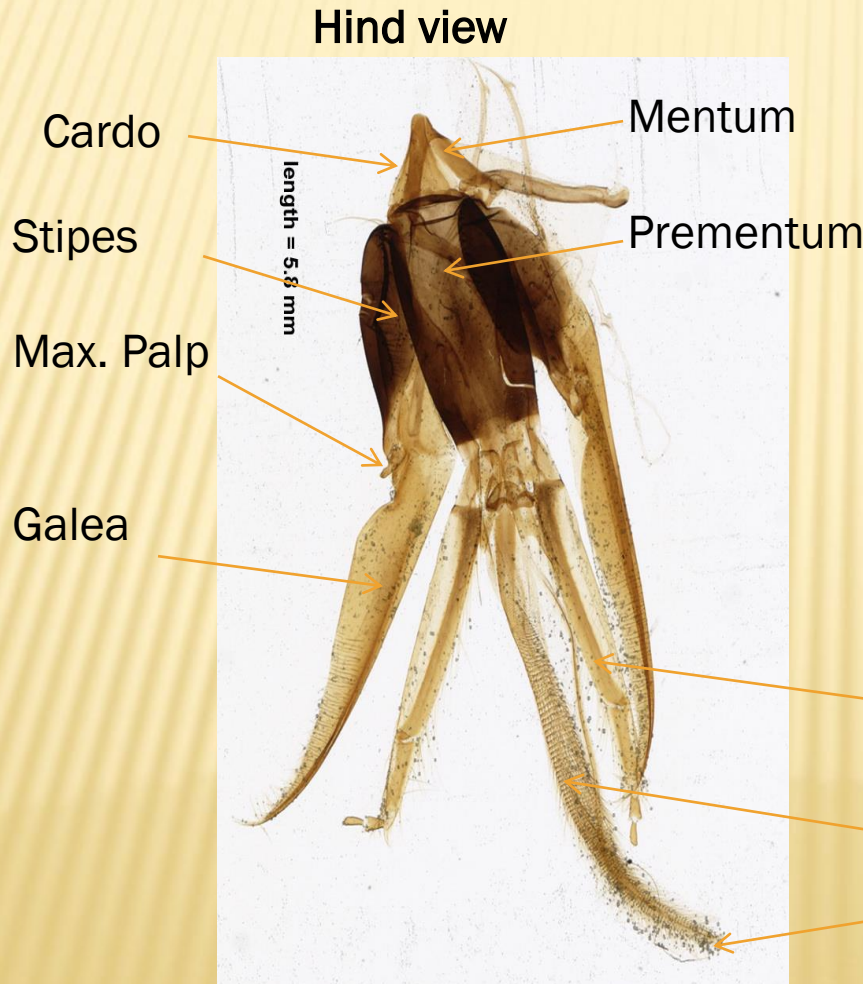


Blue bottle fly (blow fly),
Calliphora vomitoria,

5-Chewing -lapping M.P.

This insect feeding on different types of food : solid (pollen) and liquid (flower juice)

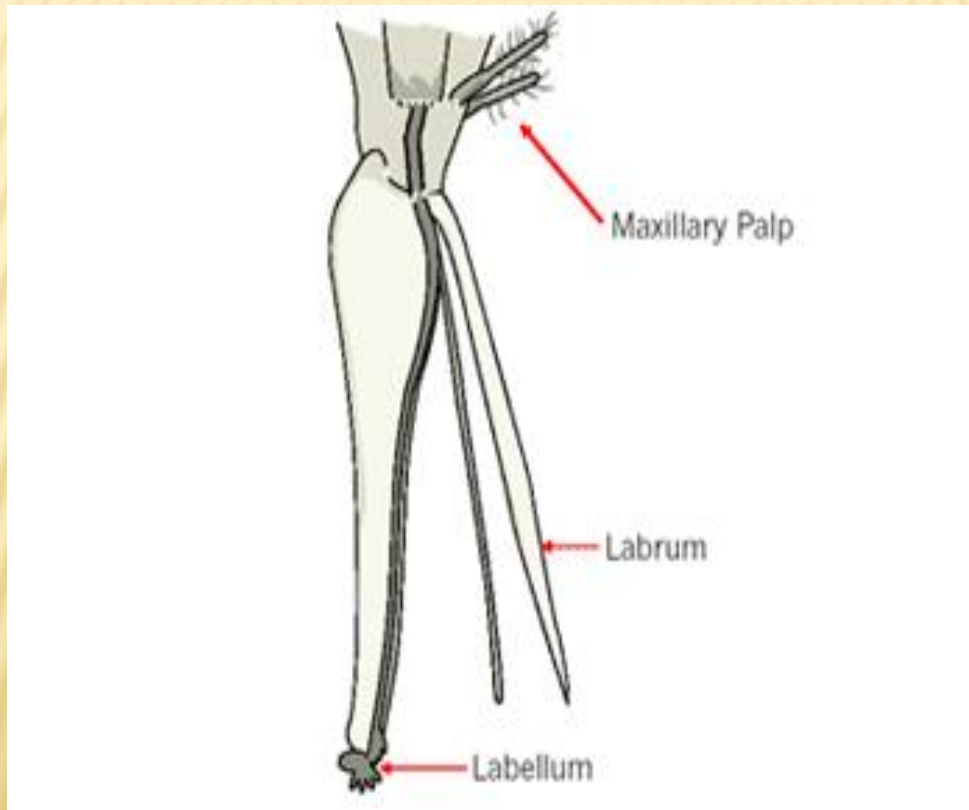
Ex : Honeybee worker



6-Cutting & sucking M. P.

Cutting the skin by strong proboscis,
Ex; Stable fly

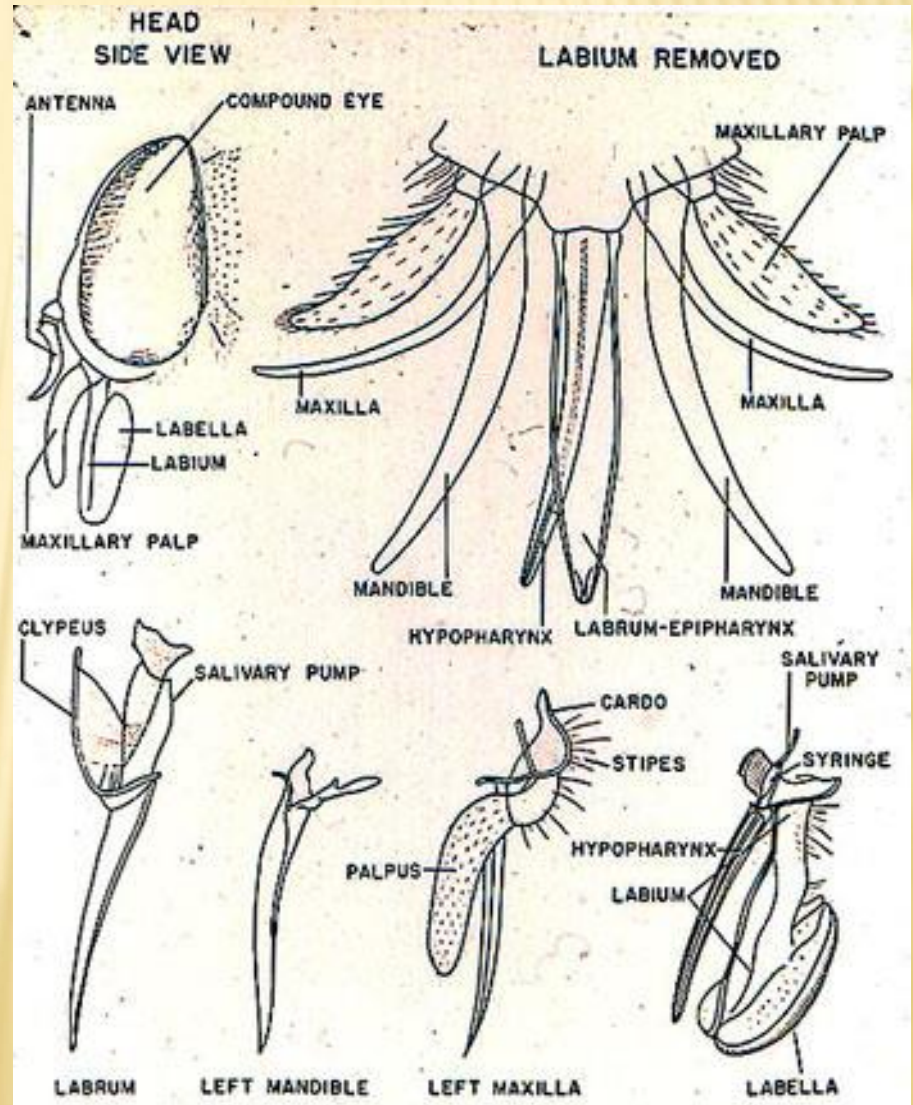
Order Diptera: , *Stomoxys calcitrans*



7-Cutting & Lapping (sponging) M.P.

Cutting the skin of animal and lapping the blood and sucking the blood

Ex: Horse fly



8-Rasping –sucking M.P.

This insect feeding on vegetable and fruit, this type of mouth part have a circular connection of development between piercing mouth part group and chewing mouth part group

Ex: Thrips



9-Mouth parts in immature stages :

A- Predaceous by sucking

Ex: Aphid`s or Ant`s lion larva



B- Predaceous by Biting

Ex: Dragonfly nymph(naiad).

