

General Entomology

Lecture (8)

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Lecture Topics

- **Digestive System**

- **Fore gut**

- **Mid gut**

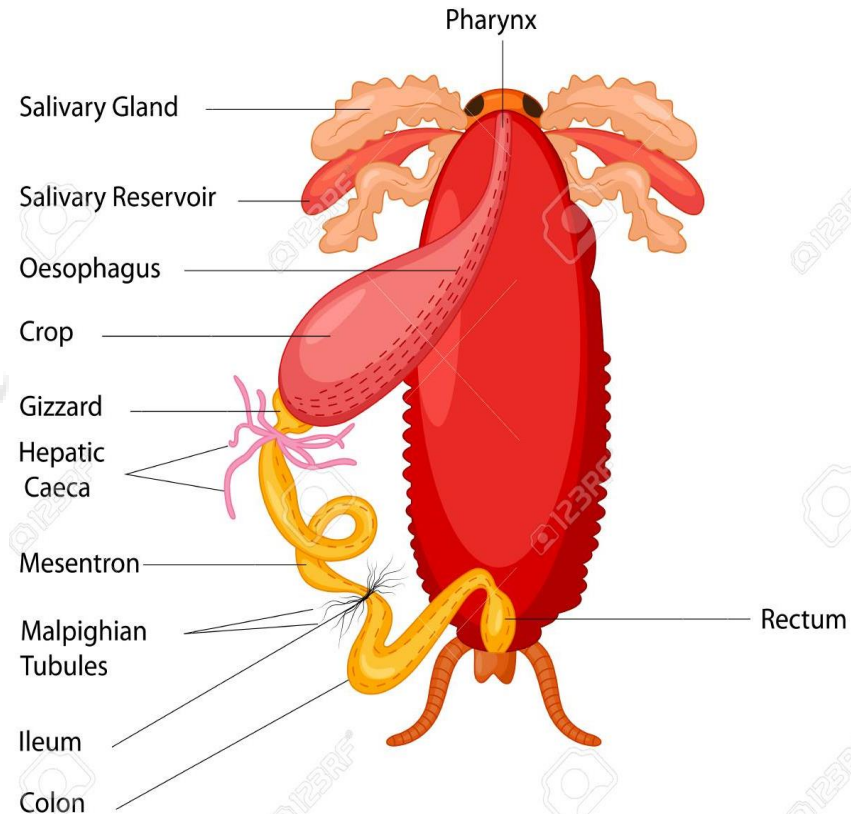
- **Hind gut**

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Digestive System

- A long straight tube running from the mouth to the anus.
- Consist of '**fore gut**', '**mid gut**' and '**hind gut**'.
- Contain Salivary Glands > may modified to do other purposes (e.g., produce silk in Lepidopteran caterpillars).
- Insects possess a large number of digestive enzymes. Although, they are often helped by the presence of symbiotic micro-organisms e.g., protozoa in the termites which feeds on wood, and bacteria in the wax moth *Galleria mellonella* which feeds on the wax.

Alimentary Canal of Cockroach



Digestive System

1. Fore gut

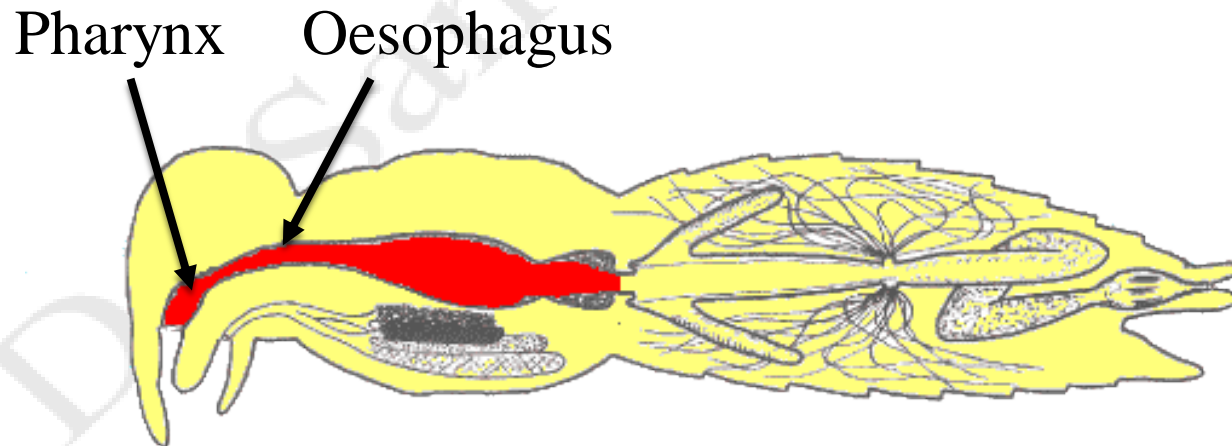
- Consist of 4 sections **Pharynx, Oesophagus, Crop & Proventriculus**

a) **Pharynx** > 1st part of the fore gut.

- Connects the mouth area (Buccal Cavity) with the next parts of the gut.

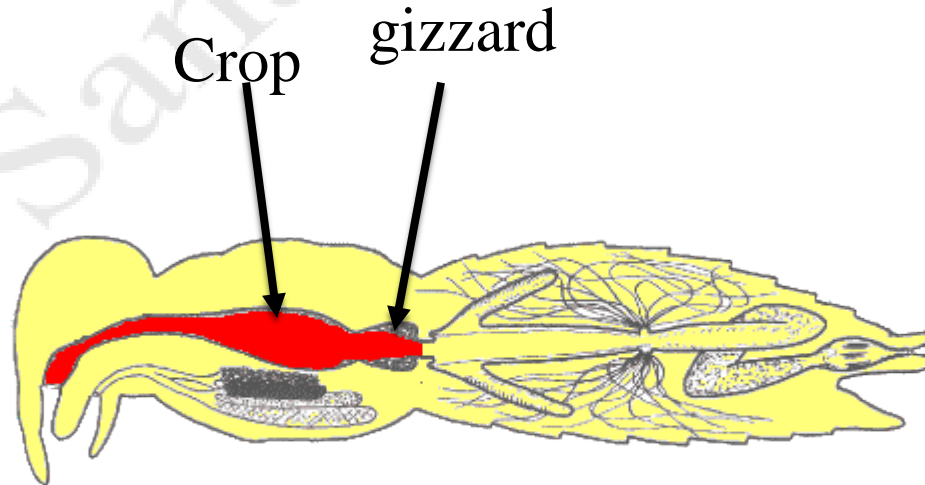
- In some insects serves as a pump to suck up the liquefied food.

b) **Oesophagus** > a tube leading to the crop.



Digestive System

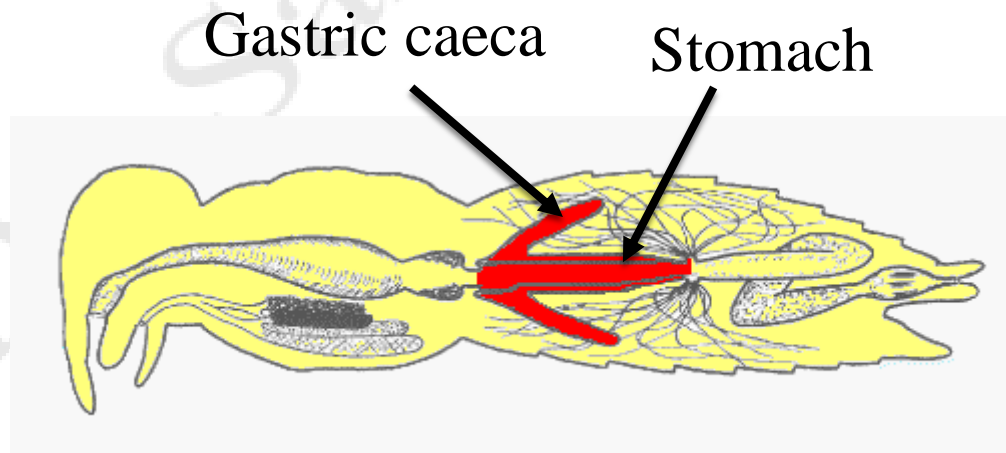
- c. **Crop** > a storage area.
- d. **Proventriculus (gizzard)** > a muscular extension of the crop.
 - Used to grind the food up into smaller particles in insects which feed on solid foods.
 - Filter to keep oversized particles out of the main digestive tract valve.
 - Controlling the flow of food into the midgut.
 - ✓ The fore gut and the mid gut are separated by the 'stomodaeal or cardiac valve'.



Digestive System

2. Mid gut (Mesenteron)

- Consist from
 - a) **Digestive or gastric caeca** > a series of stubby pointed tubes leading off from the stomach.
 - Serve to increase the surface area of the midgut both the ability to secrete digestive enzymes and extracting useful products from the partially digested food.
 - b) **Stomach or ventriculus** > the area of most active digestion.
- The mid gut and the hindgut are separated by the 'proctodeal valve'.

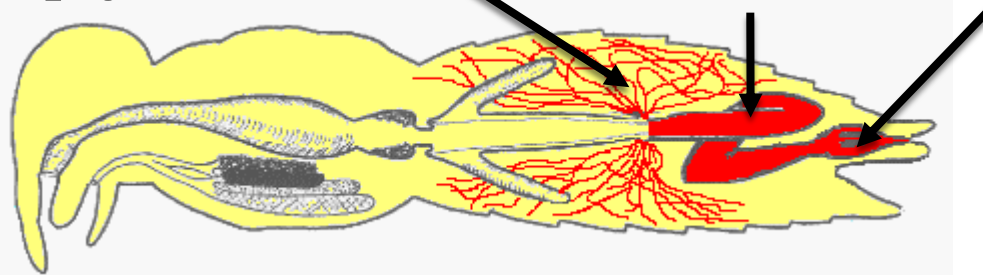


Digestive System

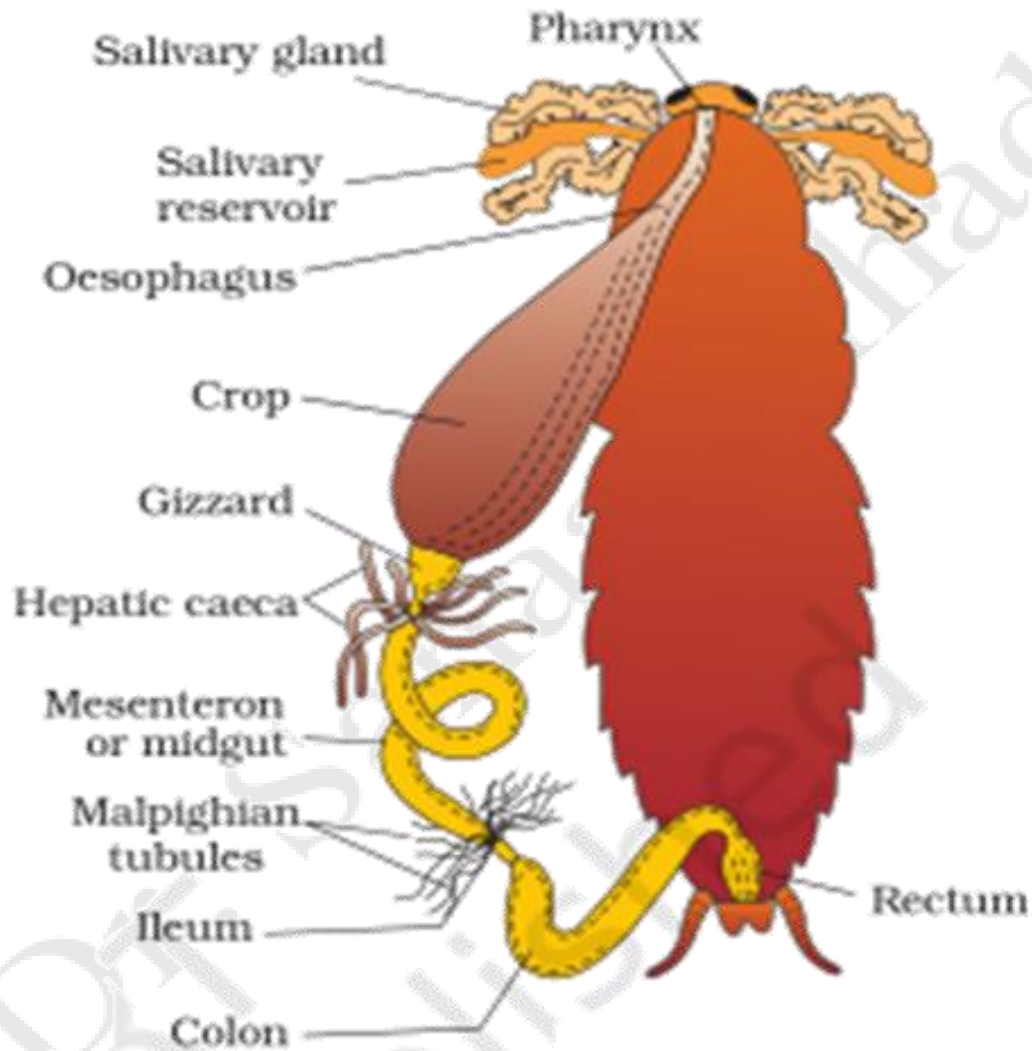
3. Hind gut (Proctodaeum)

- a) **Malpighian tubules** > a series of long thin tubes.
 - Elimination= human kidneys.
 - Extract metabolic waste products from the circulating body fluid (haemolymph) and excrete them into the intestines.
- b) **Intestines** > where the diffusion into the insects body occurs.
- c) **Rectum** > compresses the undigested food and waste products, extracts more water from this if necessary before it is passed out through the 'anus' as faeces.

Malpighian tubules Intestines Rectum



Digestive System



Alimentary Canal of Cockroach

Usfel websites

<https://genent.cals.ncsu.edu/bug-bytes/digestive-system/>

<https://faculty.ucr.edu/~legneref/entomol/internalanatomy.htm>

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Thanks for listening

