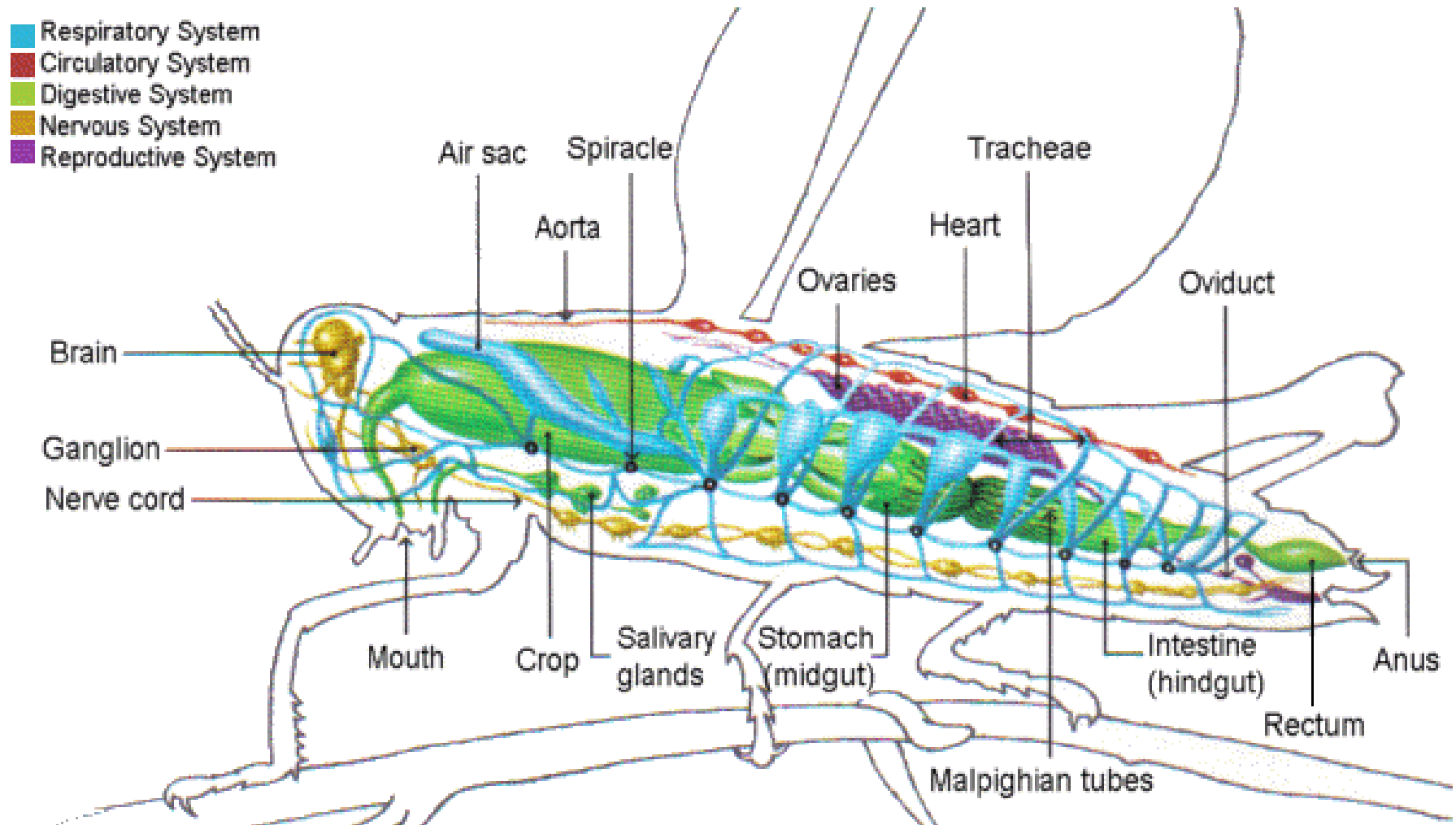


Internal Morphology Ak Grasshopper (*Poekilocerus pictus*)

Internal Systems

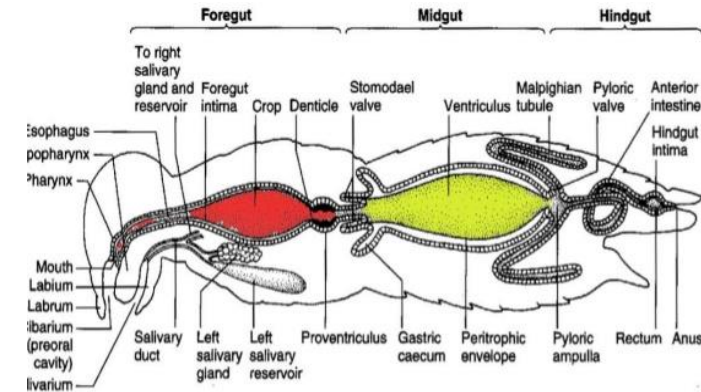


Internal Morphology Ak Grasshopper (*Poekilocerus pictus*)

Digestive System

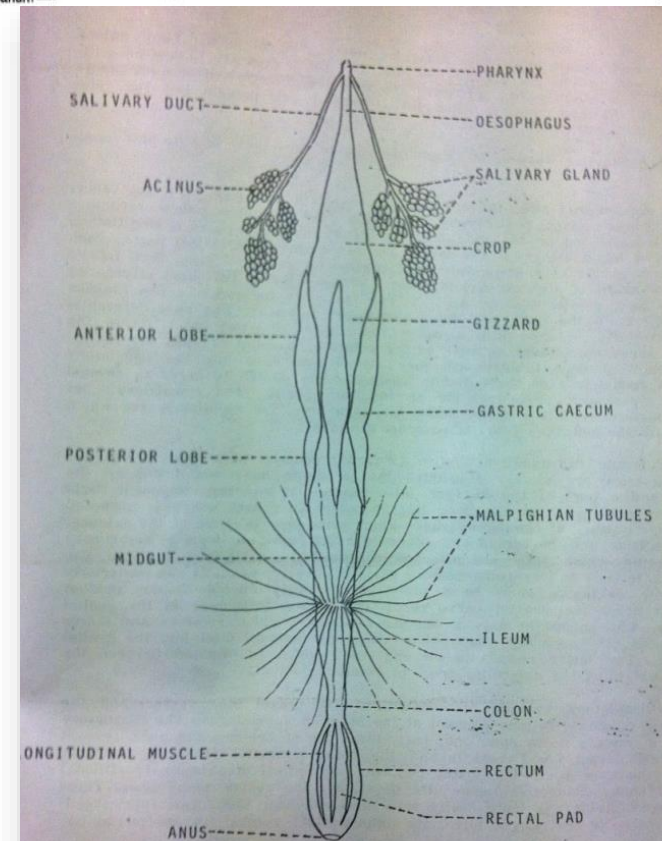
Alimentary Canal (gut) is divided into

- **Foregut** (stomodaeum)
- **Midgut** (mesenteron, ventriculus or stomach)
- **Hindgut** (proctodaeum or intestine)



Foregut:

- Mouth, oral cavity, pharynx, oesophagus, crop and gizzard
- Role of **salivary** glands
- The **mouth cavity - pharynx** (throat)
- The **pharynx** forms posteriorly a narrow **oesophagus**
- The **oesophagus** gradually widens to form the large **crop**
- **Crop** acts as a food reservoir.
- **Crop** opens into the **gizzard** (proventriculus)
- **Gizzard** is provided with a cardiac (oesophageal) valve and surrounded by anterior lobe of gastric caecum

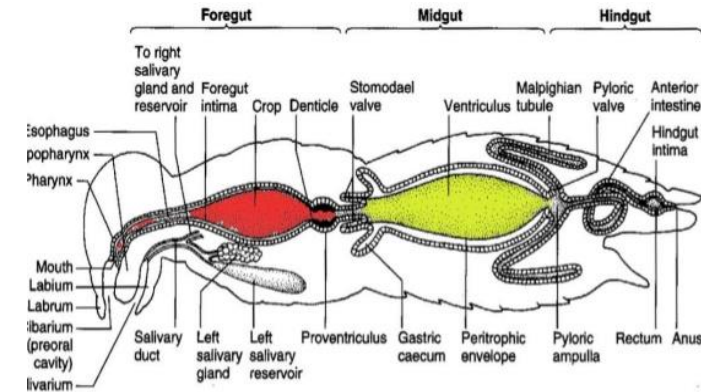


Internal Morphology Ak Grasshopper (*Poekilocerus pictus*)

Digestive System

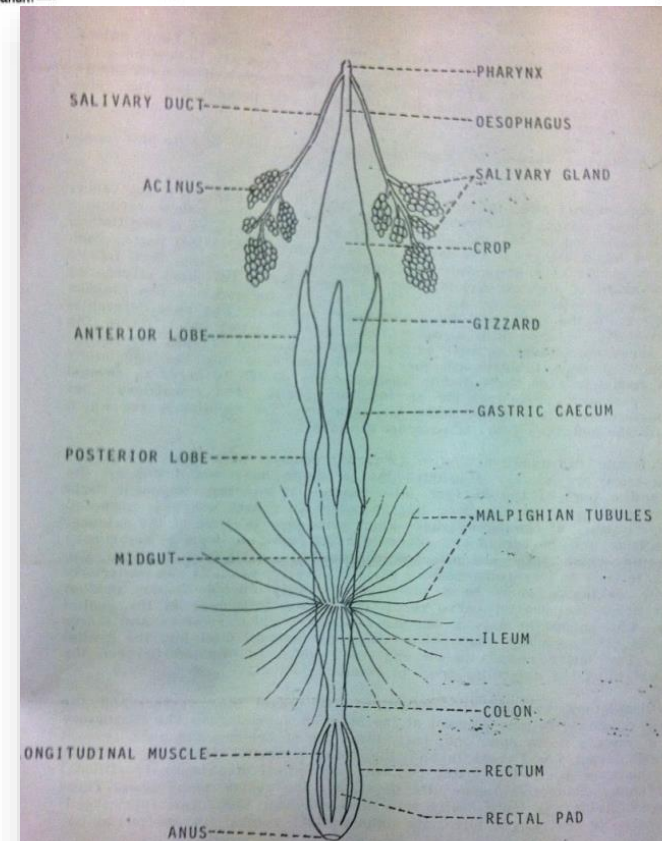
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Midgut:

- Comparatively a short, cylindrical and straight tube
- **Gastric caeca** on anterior end
- **Gastric Caecum** consists of a longer anterior lobe and a shorter posterior lobe
 - Anterior lobes have secretory functions.
 - Posterior lobes are filled with food
- Midgut is lined with **peritrophic membrane** for the protection of secretory cells from friction of food particles
- **Malpighian tubules** on posterior end
- **Pyloric valve** at the junction of the midgut and hindgut

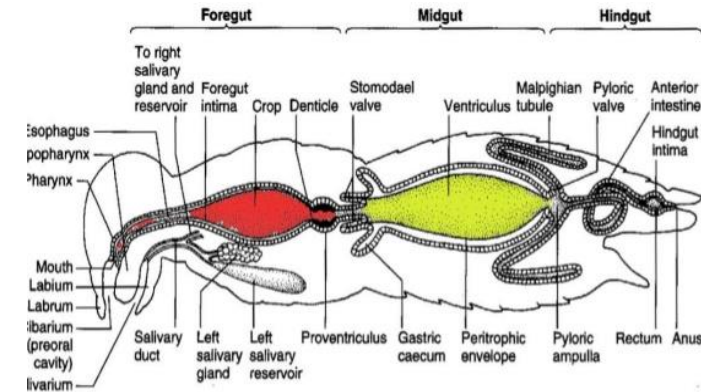


Internal Morphology Ak Grasshopper (*Poekilocerus pictus*)

Digestive System

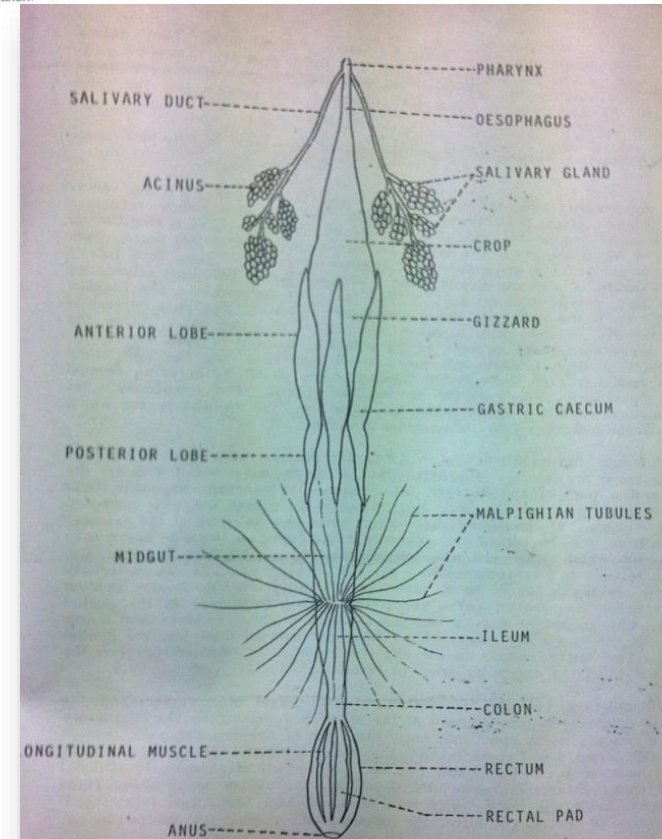
Alimentary Canal (gut) is divided into

- **Foregut** (stomodaeum)
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Hindgut:

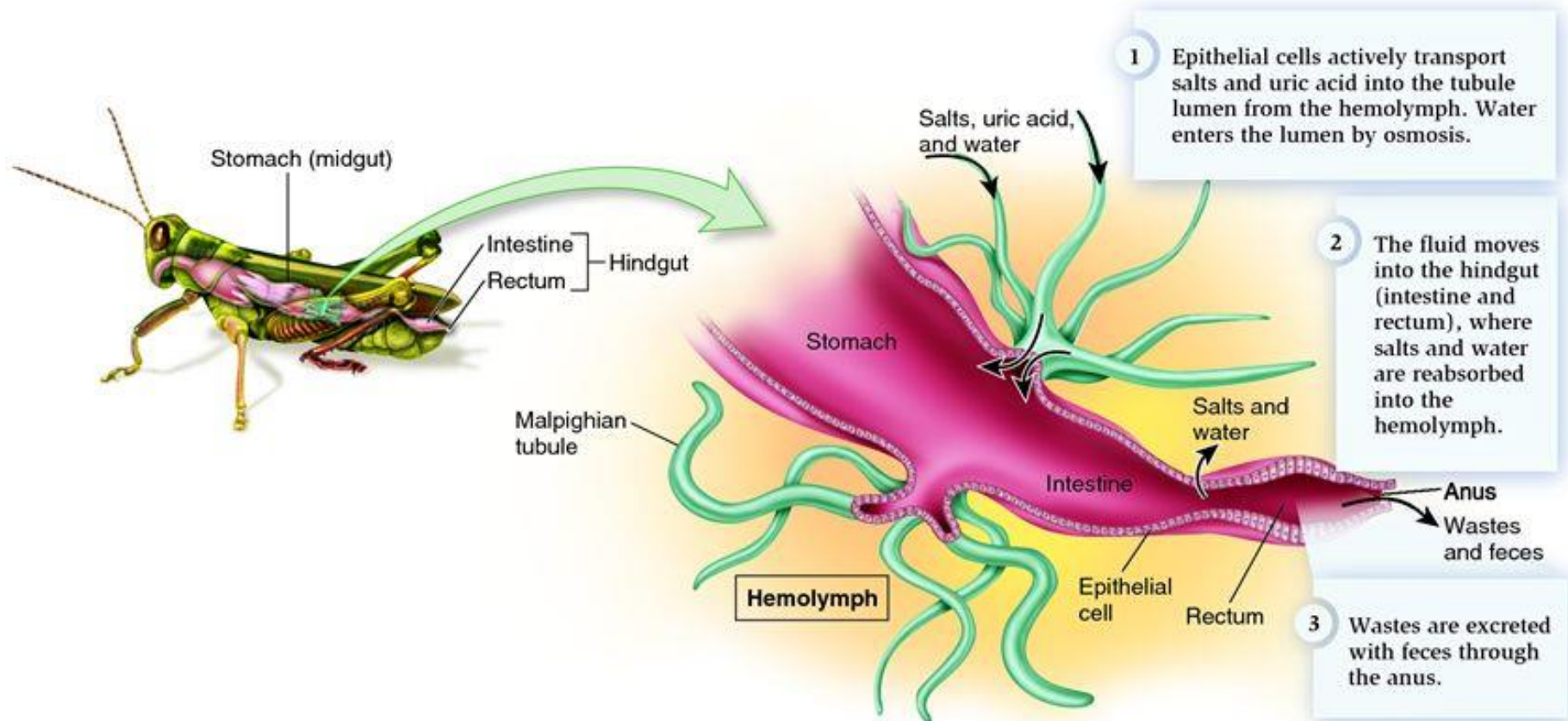
- The hindgut consists of ileum, colon and rectum
- **Ileum** (small intestine) is a thick and straight tube narrows posteriorly
- **Colon** (large intestine) is a short, narrower tube broadens posteriorly
- **Rectum** is a wider tube which is externally provided with six bands of **longitudinal muscles** alternating with six long **rectal pads** (papillae)
- **Rectum** ends at anus for excretions



Internal Morphology Ak Grasshopper (*Poekilocerus pictus*)

Excretory System

- **Malpighian tubules** and **Fat Bodies**
- **Malpighian** tubules are long, very slender, blind tube
- Extend anteriorly and posteriorly around the gut
- **Fat bodies** are yellow or white masses of cells surrounding the gut
- The principal function of the fat bodies is to store the food reserves like fat, glycogen and protein in addition to excretory functions.

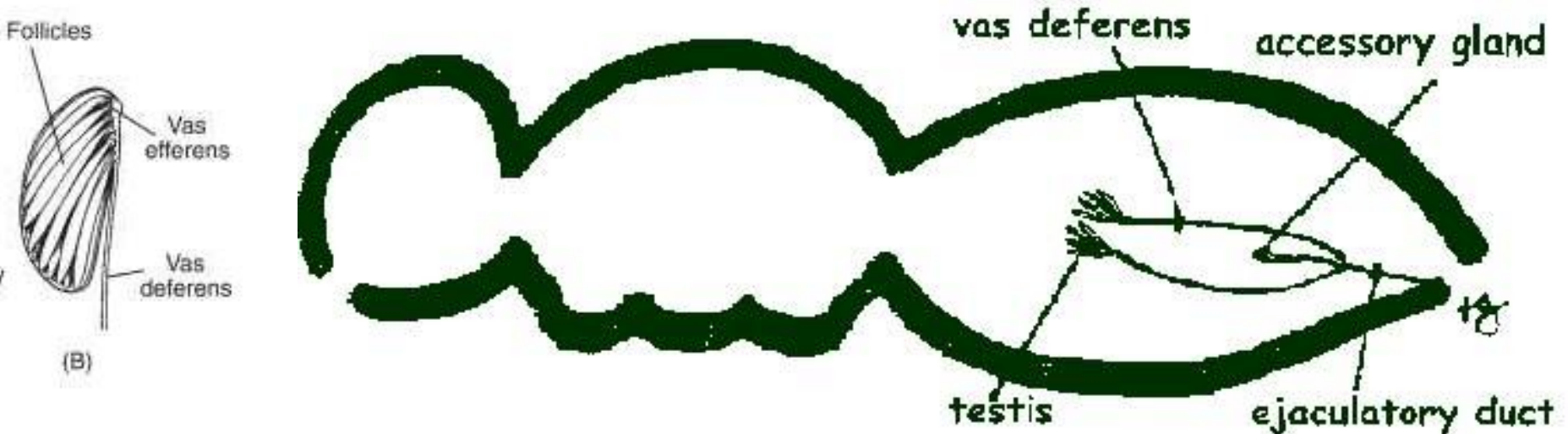
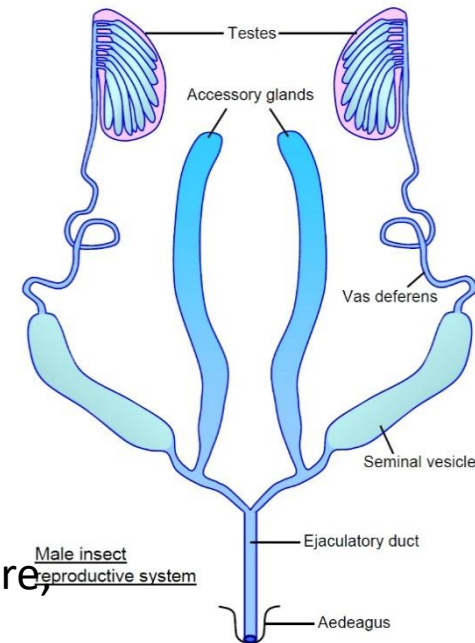


Internal Morphology Ak Grasshopper (*Poekilocerus pictus*)

Reproductive System (male)

A pair of **testes** and associated **glands**

- Testis is composed of a large number of tubular testicular **follicles**
- **Follicles** open by means of **vas efferens** into **vas deferens**
- **Follicles** are attached to the body wall by a **suspensory ligament**
- The vasa deferentia are attached to the body wall by a suspensory ligament
- The vasa deferentia open into a wider tube, ejaculatory duct
- Two groups of long tubular accessory glands also open into the ejaculatory vesicles (vesiculae seminales) for storing the sperms
- The ejaculatory duct opens posteriorly into a large pouch-like structure, the ejaculatory sac which opens into the aedeagus



Internal Morphology Ak Grasshopper (*Poekilocerus pictus*)

Reproductive System (female)

A pair of **ovaries** and associated **glands**

- **Ovaries** are closely associated as a single body lies on midgut and a part of the hindgut
- Each ovary is composed of a large number of tubular ovarieoles which arise from the side of the oviduct
- **Ovarieoles** end in thread-like filaments which unite to form a **suspensory ligament**
- The **oviduct** also extend anterior to form two **accessory glands** and posteriorly (vagina) below the ventral nerve cord
- The **vagina** terminates in the genital chamber
- The **spermatheca** is a sac-like oval body which receives and stores the sperms. It opens by means of a coiled **spermathecal duct** into the **genital chamber**.
- **Genital chamber** ends into an egg-guide of ovipositor

