

B.Sc First year Zoology (Subsidiary)

Paper-1

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Excretory system of palaemon (prawn)

Excretory organs of Prawn are known as green glands or antennal glands (Fig. 18.13). They are called green glands for their colour and antennal gland for the location at the base of the second antennae. These are paired white organs. Each organ remains within the coxa of each second antenna.

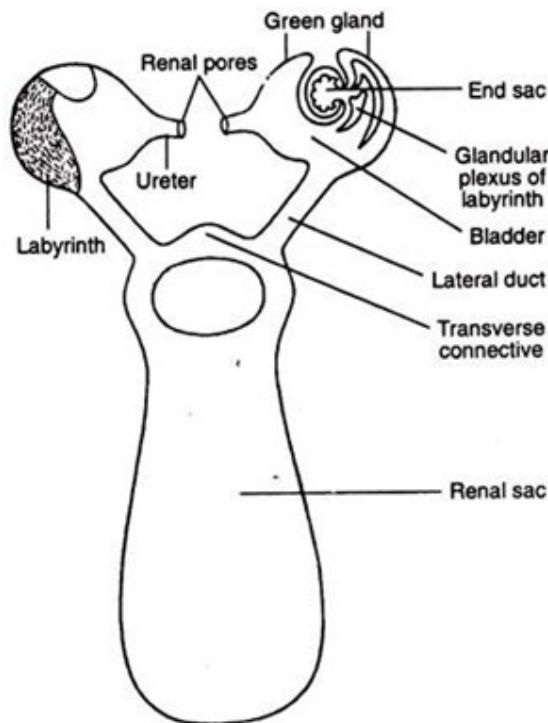


Fig. 18.13: Diagrammatic view of the excretory organs of *Palaemon*. These are called green glands or antennal glands and here the gland of the right side has been dissected to show the internal structures.

The organ consists of following parts:

(A) End sac:

This small bean-shaped part contains a blood lacuna. Its wall is two-layered, the inner layer is of epithelial cells having excretory function and the outer thick connective tissue layer has minute

lacunae. Radially arranged partitions, called septa, project from the wall within central cavity.

(B) Labyrinth:

Present outside the end sac and contains many narrow, branched and coiled excretory tubules. Each tubule communicates with the end sac by a single opening but opens within the bladder through several apertures. A single epithelial cell layer having excretory function lines each tubule.

(C) Bladder:

It is a thin-walled sac with an epithelial lining. It communicates with the exterior through a small ureter.

(D) Excretory opening:

It is present on the base of each second antenna. Both the green glands are connected with a common large thin-walled transparent and centrally placed sac, called the renal sac. It is present between the cardiac stomach and the carapace and it communicates with the bladder of each green gland by a separate lateral duct. The two lateral ducts are interconnected by a transverse connective.

Physiology of Green Glands of Prawn:

The green glands perform two important functions:

1. Elimination of nitrogenous waste products and
2. Maintains the osmotic equilibrium.

1. Elimination of nitrogenous waste products:

End sac and the labyrinth are the two regions responsible for extracting urine from the blood. The most nitrogenous products include ammonia, a major excretory product in all crustaceans (the ammonia compounds are excreted by end sac in only aquatic crustaceans), and also urea and uric acid.

The excretory products are conveyed by the excretory ducts of the labyrinth from the surrounding blood of the haemocoel.

Ultrafiltration of the blood takes place across the wall of the end sac. The labyrinth walls are folded and glandular which are considered

as the site of selective reabsorption. The primary urine is modified when it passes through the parts of the excretory system. The urine remains temporarily stored within the bladder and is periodically expelled through renal pore.

2. Maintains the osmotic equilibrium:

The excess water which enters the body is separated from the body fluid by the green glands to maintain osmotic equilibrium and volume regulation of the body fluid is achieved.

In addition to green glands, gills and integumental covering are also responsible for excretion. The exoskeleton at the time of its periodic replacement carries a large quantity of excretory products.