LEECH (HIRUDINARIA)

Habitat of Leech

- The leech, Hirudinaria, is a segmented worm inhabiting fresh-water tanks, ponds and shallow weedy lakes.
- They grow abundantly in swamps and pools near paddy fields, where they can easily suck blood from the bare-footed farmers as well as from the cattle.
- The animal is an ectoparasite.
- The blood-sucking habit of the leech had been frequently utilised by the older physicians for the purpose of letting oat blood. This practice has now become obsolete and a leech is rarely employed for blood-letting

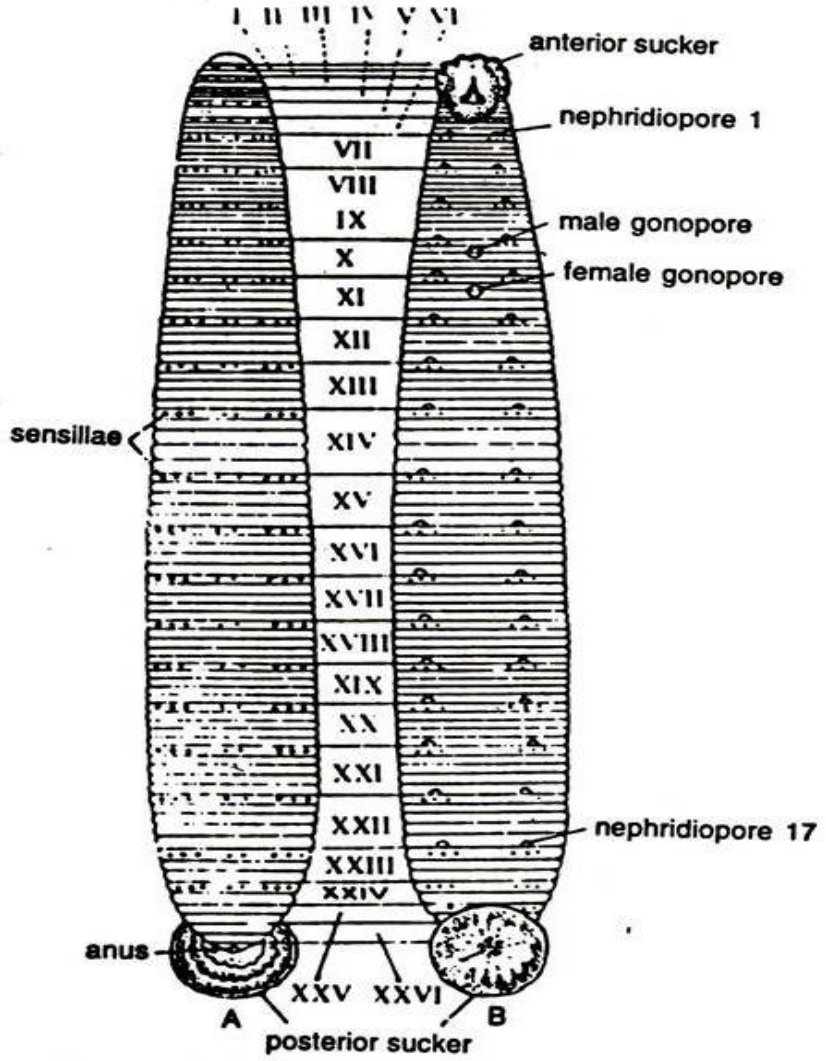

Fig. 24.25. Leech (Hirudinaria medicinalis). A. Dorsal view, B. Ventral view

External Features

- The body of the leech (Hirudinaria) is elongated, dorsoventrally flat, with a convex dorsal and a flat ventral surface.
- The body is broader at the middle and narrower towards both the ends.
- A full grown leech varies in length from 300 to 350 mm with an olive green dorsal and an orange red ventral surface.
- Each lateral line of the body bears an orange or yellow stripe, and ventral to each stripe is a broad black stripe.
- **Two suckers are present, one at the anterior and the other at the posterior end of the body:**
  - The anterior or cephalic sucker is oval shape and placed on the ventral surface at the anterior end of the body. It is formed by the fusion of a few anterior body segments and the prostomium. It bears a depression at the centre.
  - The posterior or anal sucker is circular in outline, large in size and is a highly muscular disc at the posterior end of the body.
- **The body is divided into 33 segments, the last 7 fused to form the posterior sucker:**
  - Each segment is subdivided into several, usually 5 rings or annuli by a series of close set transverse grooves.
- The number of segments is determined by counting the segmental receptor organs or sensillae. These are dot-like elevations on the skin of both the dorsal and ventral surfaces and restricted to the first annulus of each somite.
- 5 pairs of sensillae (eyes), appearing as black dots on the dorsal surface of 2 to 6 segments, are called eyes.
- The Mouth is a narrow triradiate aperture at the centre of the depression of the anterior sucker.
- The anus is a small aperture on the dorsal surface at the junction of the body and the posterior sucker.
- 17 pairs of nephridiopores are present on the ventral surface, a pair in the last annulus of each of the segments 6 to 22.
- The leech is hermaphrodite, i.e. both the male and female reproductive organs are present in the same individual.

- **The gonophores are situated on the ventral surface of the body:**
- The male gonopore is single and median and lies in the groove between the second and third annuli of the 10 segment.
- The female gonopore is also single and median. It lies in the groove between the second and third annuli of the 11 segment.

Body Wall and Body Cavity of Leech

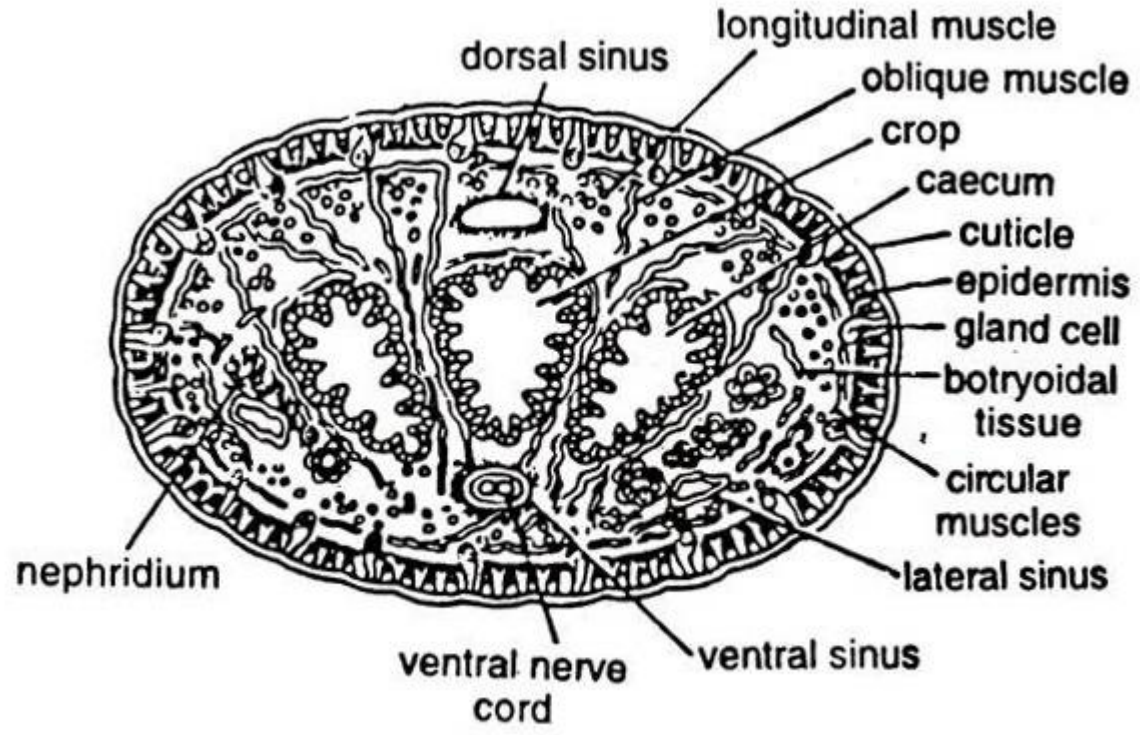

Fig. 24.26. Hirudinaria sp. Transverse section. Crop region

The body wall of leech consists of a thin cuticle, the epidermis, the dermis, the musculature and the botryoidal tissue. It is best studied in a cross-section passing through the middle of the animal

(1) The cuticle is a transparent non-cellular membrane which forms a delicate protective covering for the entire body. It is secreted by the underlying epidermis and is cast off periodically to be replaced by a new one.
(2) The epidermis is a single layer of columnar cells with their broad ends directed outwards. The spaces between the narrow inner ends of the epidermal cells are filled with a network of capillaries, a small

amount of connective tissue and a large number of pigment cells, all of which are derived from the underlying dermis.

The epidermis, therefore, forms a vascular membrane through which exchange of gases during respiration may readily take place. Some of the epidermal cells are converted into pear-shaped glands which secrete mucus for moistening the skin; others are modified to form the various receptors which act as sense organs.

(3) The dermis is a thin basement membrane beneath the epidermis. It consists of fibres, capillary loops and brightly coloured pigment cells, which extend into the epidermis. The cuticle, epidermis and dermis together form the skin of the leech.

(4) The muscles lie beneath the dermis. This constitutes the thickest part of the body wall. There is an outer layer of circular muscle fibres running round the body, and an inner layer of longitudinal muscle fibres extending along the length of the body.

Besides these, there are other bundles running obliquely and from dorsal to ventral surface. The muscles are composed of highly elastic spindle-shaped cells which help the leech to carry on locomotion.

The musculature encloses the body cavity which is filled up by a peculiar kind of spongy connective tissue called botryoidal tissue. With the help of this, the layer of longitudinal muscles is firmly adherent to the wall of the underlying alimentary canal.

The coelom or body cavity is distinct in a leech embryo. In the adult leech there is no distinct body cavity. The space is obliterated by the botryoidal tissue and reduced to certain longitudinal channels filled with blood. These are known as the hoemocoelomic channels.

The botryoidal tissue lies just beneath the longitudinal layer of muscles. It consists of a network of minute canals which are loaded with a dark brown pigment. The free ends of the canals communicate with the hoemocoelomic channels and they are filled with hoemocoelomic fluid.

Several canals are enclosed in a thin sheath of connective tissue which adheres to the gut internally and longitudinal muscles externally. The botryoidal tissue is believed to remove waste products but a definite proof in favour of this assumption is wanting.

The gut lies in the centre enclosed by botryoidal tissue. It is represented in the middle of the body by the crop and its caeca. Four hoemocoelomic channels are found running longitudinally between the body wall and the gut wall.
Dorsal to the crop lies the dorsal hoemocoelomic channel, whilst the ventral hoemocoelomic channel, enclosing the nerve cord, is situated ventrally. Lateral to the caeca, there is a lateral hoemocoelomic channel on each side of the body.