Reproductive System of Leech (Hirudinaria):
The leech is hermaphrodite but auto-fertilization does not take place.

Male Reproductive System:
1. The male reproductive organs consist of testes enclosed in testes sacs, the vasa efferentia vasa deferentia, the epididymis, the ejaculatory ducts, the atrium and the male genital pore.

2. The testes sacs are 11 pairs, one pair in each segment, on either side of the nerve cord in the segments from 12th to 22nd.

3. A short duct, the vas efferens arises from the posterior border of each testis sac and runs outward to end in the vas deferens. 11 vasa efferentia from 11 testes sacs of the side end in the longitudinal vas deferens of the side.

The two vasa deferentia run anteriorly from the 22 segment, and each forms a much convoluted epididymis in the 10 segment. A narrow muscular ejaculatory duct arises from each epididymis and leads to a median sac, the atrium.

4. The atrium is an oval sac consists of a large anteriorly placed base and a posteriorly directed neck. The base bears a thick wall having a large number of unicellular prostate glands. The neck contains a penis sac bearing a long, hollow filamentous penis, which can be protruded to the exterior through the male genital pore placed on the ventral surface of the 10 segment.

5. Spermatozoa budded in the walls of the testes sacs pass through vasa efferentia, vasa deferentia and are stored in the epididymis, where they are packed in bundles, the spermatophores and thrown into the atrium by the ejaculatory ducts. Spermatophores pass to the exterior through the penis.

Female Reproductive System:
1. The female organs consist of a pair of ovaries enclosed in ovisacs, a pair of oviducts, a common oviduct, albumen glands and a female gonopore.

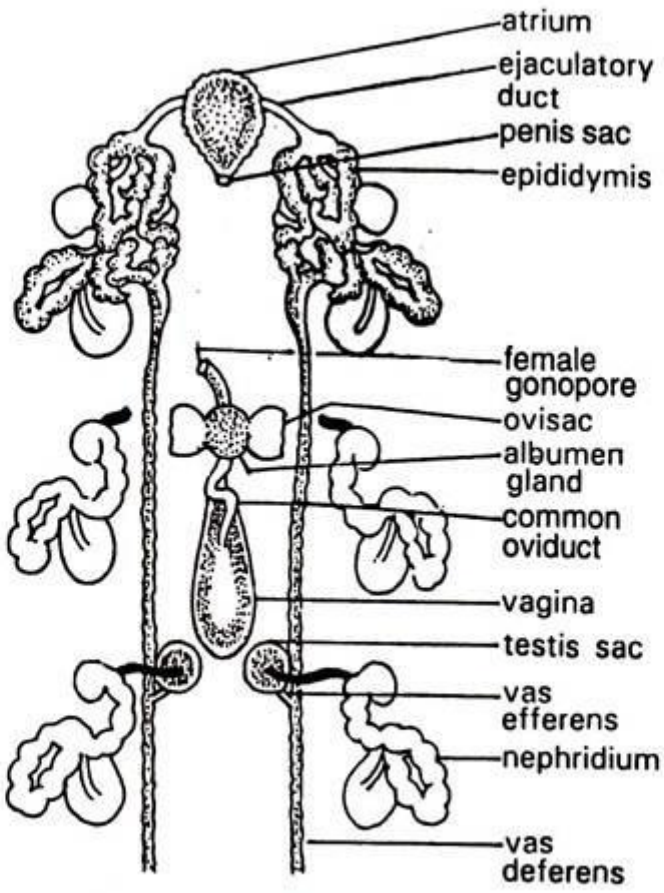

Fig. 24.36. Hirudinaria sp. Reproductive system, pretesticular and testicular nephridia. Male reproductive system (a part). Female reproductive system (whole). Three pairs of nephridia—two pairs pretesticular and one pair testicular

2. The ovisacs are white bodies lying in the 11 segment by the sides of the ventral nerve cord. Each ovary is a delicate filamentous cord made up of club-shaped cells.

3. A short duct/ the oviduct arises from the base of each ovisac. The two oviducts unite below the ventral nerve cord and form a common oviduct, the region of union is covered by unicellular albumen glands. The common duct forms a ‘S’-shaped structure and passes through a mass of albumen gland and opens in a large muscular sac, the vagina.

The vagina bears a lateral diverticulum, the vaginal caecum and it opens to the exterior through the gonopore placed on the ventral surface of the 11 segment.

4. The ova, budded in the ovaries while passing through the anterior part of common oviduct, receive albumen from the albumen glands and remain stored in the vagina where they are fertilized during mating and then escape to the exterior.

Copulation and cocoon formation:
Leeches reproduce in early spring through cross-fertilization.

Copulation:
During mating two individuals come close in head-to-tail position and ventral surface of one is placed against the ventral surface of the other. The male gonopore of one is placed against the female gonopore of the partner and the penis of one enters the vagina of the other and vice versa. Mating continues for about an hour, during which mutual exchange of spermatophores occur. Fertilization takes place in the vagina.

Cocoon formation:
During mating a snow-white foamy girdle is secreted around the clitella by the glands of the clitellar segments. While the leeches pull out of the girdle, the fertilized ova from the vagina are forced out into the girdle. Before abandoning the girdle the leeches plug it's both ends with the secretion of prostomial glands and the cocoon is formed.

Development:
Development is direct and completed within fifteen days, following which the plugs of the cocoon drop off and young leeches come out.

Life-History of Leech (Hirudinaria):
The usual breeding season is early spring. Two worms meet and become applied to each other in a head-to-tail position, so that the male gonopore of one lies opposed to the female gonopore of the other. There is a mutual exchange of spermatophores between the two worms and thus cross fertilization is ensured. Mating may take place in moist land or under water and the whole process usually lasts for an hour, after which the worms separate. The spermatophores received from the other worm pass into the vagina, where fertilization of the ova takes place.
In the meantime the clitellar segments (9th, 10th and 11th) swell up and secrete a snow-white frothy substance which gradually sets into a jelly-like girdle. The leech now tries to wriggle out and free itself from the soft mass. During the struggle fertilized ova are discharged through the female gonopore, coming to lie in the jelly.
The leech ultimately frees itself from the girdle, the two ends of which are quickly plugged. The soft mass, on exposure to air, hardens to form a cocoon

which contains fertilized ova floating in the albumen secreted by the clitellar glands. The cocoon formation is completed in about six hours, after which they are laid in moist places by the side of a pool.

Each cocoon is a barrel-shaped structure about 30 mm. long and half as broad. It is light yellow to amber in colour and is provided with a hard chitinous wall. A cocoon contains about two dozen embryos.

Development takes place within the cocoon directly, and young leeches hatch out in about a fortnight. The polar plugs give way to let out the young, which in the meantime have completely used up the albumen. There is no metamorphosis.