

P. Crustaceans I, Unit 4, Subunit 4.2

Topic - Organs of Excretion: Coelomocoelates & Nephrosomes (Part-II)

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Control. from Part I -

The nephrosomes in Pheretima are of three types according to their in the body -

- (i) Septal nephrosomes.
- (ii) Integumentary nephrosomes and
- (iii) Pharyngeal nephrosomes.

(i) Septal nephrosomes :- These are found situated on the intersegmental septum between 15<sup>th</sup> and 16<sup>th</sup> segments to the posterior side of the body. Each septum bears nephrosomes on both the surfaces arranged in semicircles around the intestine, two rows in front of the septum and two behind it. Each septum has about 40 to 50 nephrosomes in front and the same number behind, so that each segment possesses 80 to 100 septal nephrosomes except the 15<sup>th</sup> segment which has only 40 to 50 nephrosomes. They are not found in the segment upto 14<sup>th</sup>.

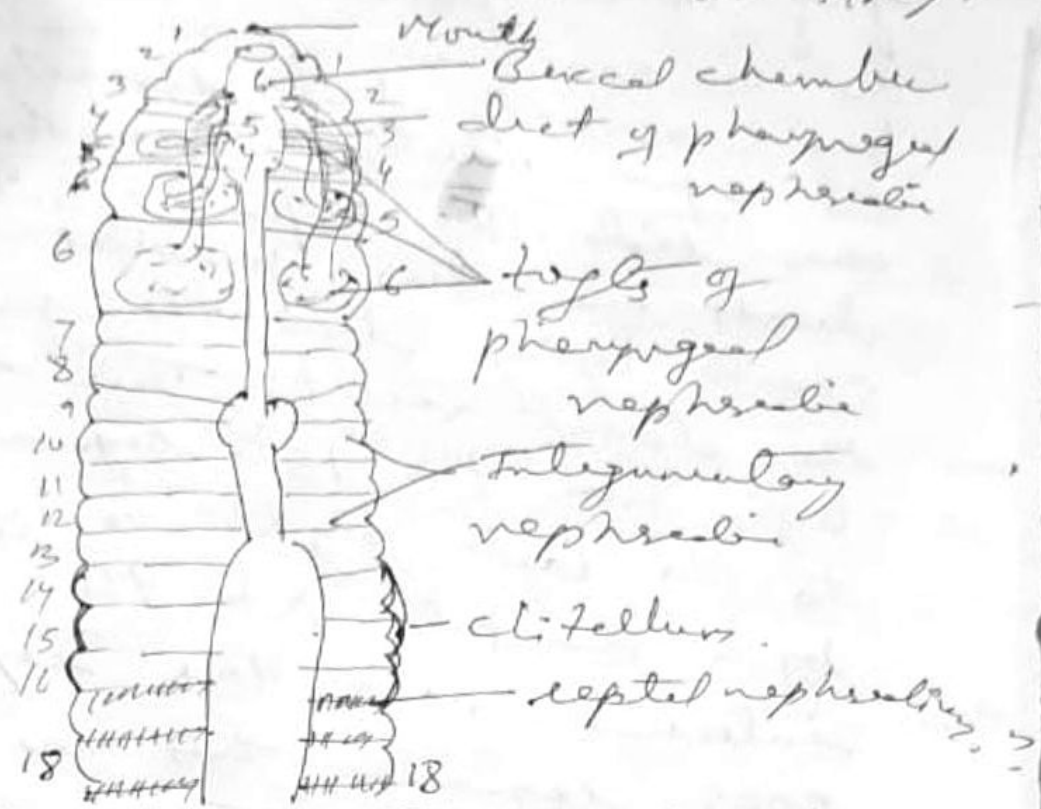
Structure - Septal nephostome is the most typical one, consisting of one nephro-stome, neck, body of nephostomium and the terminal duct. (92)

(i) Nephrostome: - also known as known as ciliated funnel or nephridio-stome. It is the proximal flattened funnel-shaped structure of the nephostomium lying in the coelom. It has no elliptical mouth-like opening leading into an intracellular canal of the large Central Cell, the margins of the opening are surrounded by a large upper lip and a smaller lower lip. The lower lip are provided with several rows of small ciliated marginal cells and the Central Canal is also ciliated.

(ii) Neck: - The nephrostome leads into a short and narrow ciliated canal forming the neck. It joins the nephrostome to the body of nephridium.

(iii) Body of Nephridium: - The body of nephostomium has two parts - a short straight tube and a long twisted loop. The loop is formed by two limbs - the proximal limb and the distal limb. Both these limbs are twisted spirally around each other the number of twists varies from 9 to thirteen. The neck of nephostomium and the terminal duct join together and remain connected with the proximal limb of the twisted

loop; while the distal limb becomes the straight lobe.



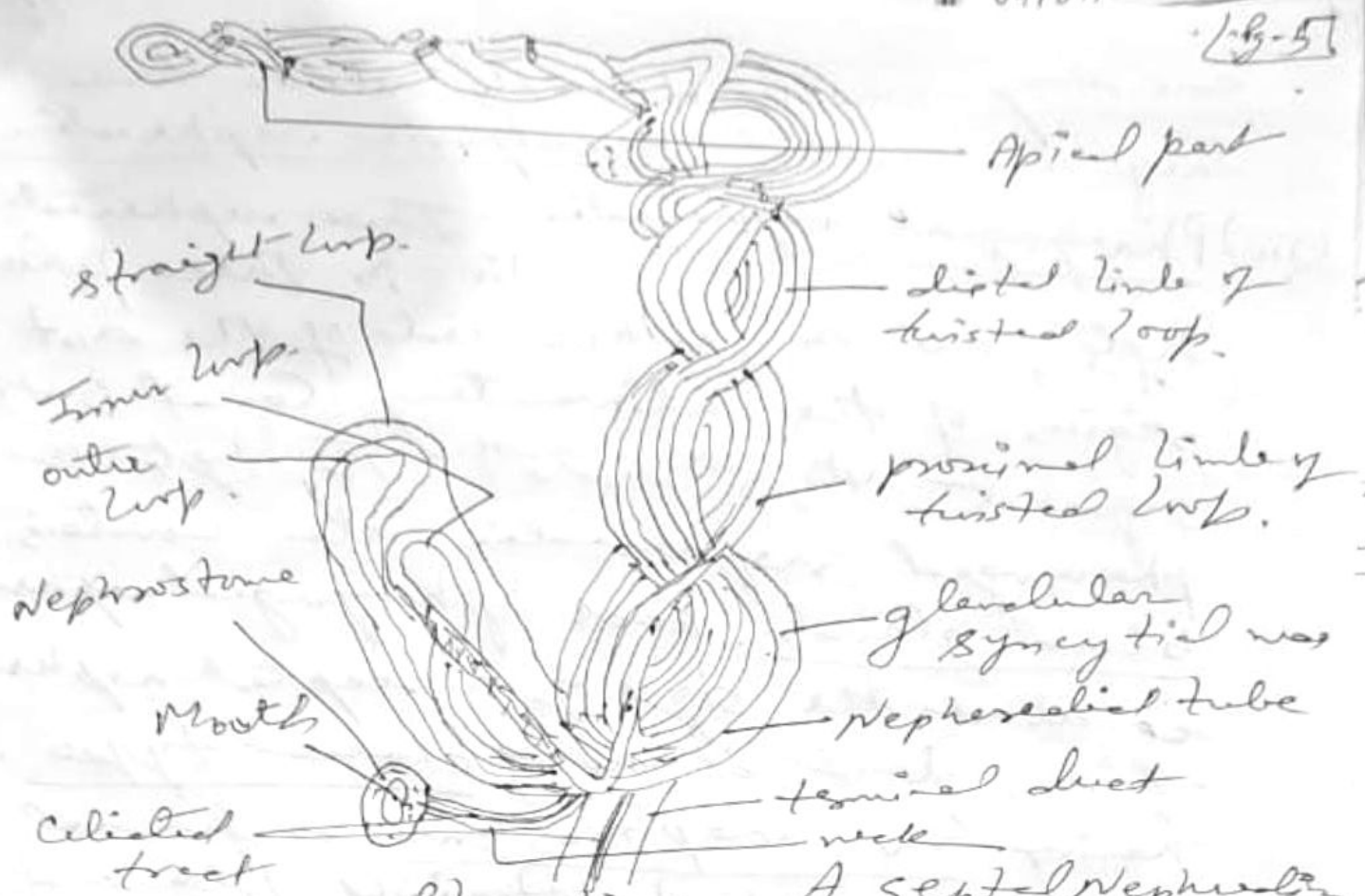
Nephridia: Three kinds of nephridia

Internally, the nephridium is made of a connective tissue matrix having long coiled nephridial duct forming loops. There are four such canals in the straight lobe, three in the lower part and two in the upper part of the limb of a twisted loop. Two canals of the straight lobe out of the four are collected like Ciliated Canal of the neck.

(iv) Terminal duct - It is short and narrow duct. It joins the nephridium with septal excretory canal. These nephridia hang freely in the coelom and are attached only by their terminal ducts. They open by their terminal ducts into two septal excretory canal

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lying on the posterior surface of the septum, one on each side of the intestine, each begins ventrally but dorsally it opens in the supra-intestinal excretory duct of its own side. The supra-intestinal excretory ducts are two parallel longitudinal canals lying above the gut and below the dorsal vessel. These excretory ducts begin from the 15th segment and run to the last right or left duct opens by a ductule into the lumen of intestine near the septum. Thus, each segment has one such opening into the intestine of either the left or the right supra-intestinal excretory duct. The waste collected by nephrosome is discharged through the excretory canal and ducts into the lumen of the intestine. Such nephrosome opening into the intestine are called intersonephrosome nephrosome. [Diag in Pg-5] →

(ii) Integumentary nephrosome -  $\frac{1}{2}$  Each segment of the body from 7 to the last segment, numerous nephrosome are found attached inside the lining of the body wall. These are called Integumentary nephrosome, which are about 200.



Pheretima - A. septal nephridium

250 is each segment except the segment of the clitellar region, where they number 2000 to 2500 is each segment. These nephridia are small in size without nephrostome and without any opening into the coelom. Hence they are called closed type of nephridia. Each Integumentary nephridium is V-shaped with a short straight lobe and a twisted loop. Its lumen has two ciliated canals. Each nephridium opens by a nephridiopore on the outer surface of the body wall directly. Since the integumentary nephridia discharge the ex.

excretory wastes directly outside, hence they are called ectonephric nephridia.

(iii) Pharyngeal Nephridia - There are three pairs lie in three pairs tufts, one on either side of the ant. region of the alimentary canal in the segments 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup>. The tufts of pharyngeal nephridia also contain blood glands. Each pharyngeal nephridium is about the size of a septal nephridium, but it is of cloacal type, having no nephrostome or funnel. It has a short straight lobe and a spirally twisted loop. Its lumen has ciliated ends. Ductules arise from each nephridium and unite to form a single thick-walled duct on each side in each segment. These nephridia discharge their secretory products into alimentary canal and therefore, enteronephric. But each nephridium, which opens into anterior region of the alimentary canal are called also as protonephridia because they may have taken the function of digestive glands.

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