EXCRETORY SYSTEM

1. Excretory organs in Phcretima are Nephridia ectodermal in orgin.
2. Typical nephridia are present in earthworms. Such as Drawida grnadis.
3. Nephrostome and nephridioporc are present in typical nephridia.
4. The ncphridium with ncphroslomc is open and without ncphroslomc is closcd
5. Typical ncphridium is open exonephric.
6. Body of ncphridium is divided into anterior ciliated, middle glandular and posterior muscular regions.
7. Ciliated, glandular regions are intracellular and muscular intercellular region is long.
8. In Pherctima nephridia arc present in all segments cxccpt the first two segments.
2. In Pherctima 3 types of nephridia arc present.
   1. Septal
   2. Integumentary
   3. Pharyngeal

SEPTAL NEPHRIDIA

1. Septal or megancphridia start from 15/16"' onwords.
2. In septal ncphridium ncphroslomc present ncphridiopore absent.
3. Septal nephridia are open cnleronephric nephridia.
4. Each septum from $15^{1,1}$ bear 4 rows of septal nephridia.
5. Each septum has 40 to 50 nephridia on each side.
6. Ncphridial body has short straight lobe and long twisted lobe.
7. The straight lobe is continued into the distal limb.
8. The proximal limb gives of the terminal duct.
9. Septal nephridia open into septal excretory canal which opens into supraintcslinal excretory canal.
10. Number of supraintcslinal canals - 2
11. Supraintcslinal excretory canals extend from 15th to last segment.
12. Septal nephridia eliminate waste from blood and coelomic fluid.
13. Highest number of nephridia arc present in 16th segment.

INTEGUMENTARY NEPHRIDIA

1. Integumentary nephridia or micronephridia are smallest nephridia present in Pherctima.
2. Integumentary Nephridia starts from 3rd segment and number ranges from 200 to 250 in each segment.
3. In cliteilar segments integumentary nephridia are present in large number called **forests of nephridia.**
4. In integumentary nephridia ncphrostomc absent, ncphridiopore present.
5. Integumentary 'nephridia are closed exonephric nephridia.
6. Integumentary nephridia arc attached to inner surface ofbodywall and open out by nephrdiopore.

PHARYNGEAL NEPHRIDIA

1. Pharyngeal nephridia are paird lulls of nephridia present in 4, 5, 6 segments.
2. Pharyngeal nephridia are also called lulled nephridia.

3. In pharyngeal nephridia both ncphroslome and ncphridopore arc absent.
4. The nephridia of 6th segment open into buccal cavity while the duels of 4th and 5th open into pharynx.
5. Pharyngeal nephridia are closcd entero nephric nephridia.

CHLORAGOGEN CELLS

1. Chloragogen cclls are derived from inner coelomic epithelium. (Mesoderm)
2. The yellow granules of chloragogen cells are called chloragosomes.
3. The dctached free chloragogen cclls arc called clcocytes.
4. Eleocylcs arc ingested by amoebocytes and sent out by septal nephridia.
5. The chloragogen cells are comparable to liver cells of vertebrates.
6. The chloragogen cells store food, manufacture urea (dcamination) and help in excretion.
7. The chief nitrogenous wastes in Pheretima arc ammonia, urea and creatinine.
8. Urine is hypotonic to both blood and coclomic fluid.
9. Entcroncphric nephridial system is an adaptation for onscrvation of water.
10. As urea is major excretory product earthworm is ureotelic animal.