

Date _____
Page _____

DIGESTIVE SYSTEM OF SCOLIODON

The digestive system of scoliodon includes the alimentary canal and a digestive glands.

Alimentary canal :-

The AC of scoliodon consists of (i) mouth
(ii) Buccal cavity (iii) pharynx (iv) Oesophagus
(v) Stomach (vi) Intestine & (vii) Rectum

1. MOUTH

The mouth is crescentic opening located on the ventral side of the head, it is bounded by dorsal and ventral jaws. The jaws are provided with homodont and polyphyodont teeth.

2. BUCCAL CAVITY

The mouth leads into the buccal cavity. The buccal cavity contain a non-muscular and non-glandular tongue.

3. PHARYNX

The buccal cavity opens into the pharynx on either side of the pharynx are

situated internal opening of the two spiracles and five pairs of gill pouches. The spiracle is vestigial and is not visible externally in scudlon.

4. ESOPHAGUS

Pharynx narrows down posteriorly and is followed by a narrow oesophagus. It has a thick muscular wall with an internal lining of mucous membrane which is raised into long longitudinal fold. Thus, the lumen of oesophagus is completely closed preventing the entering of water, which continuously passes through the pharynx.

5. STOMACH

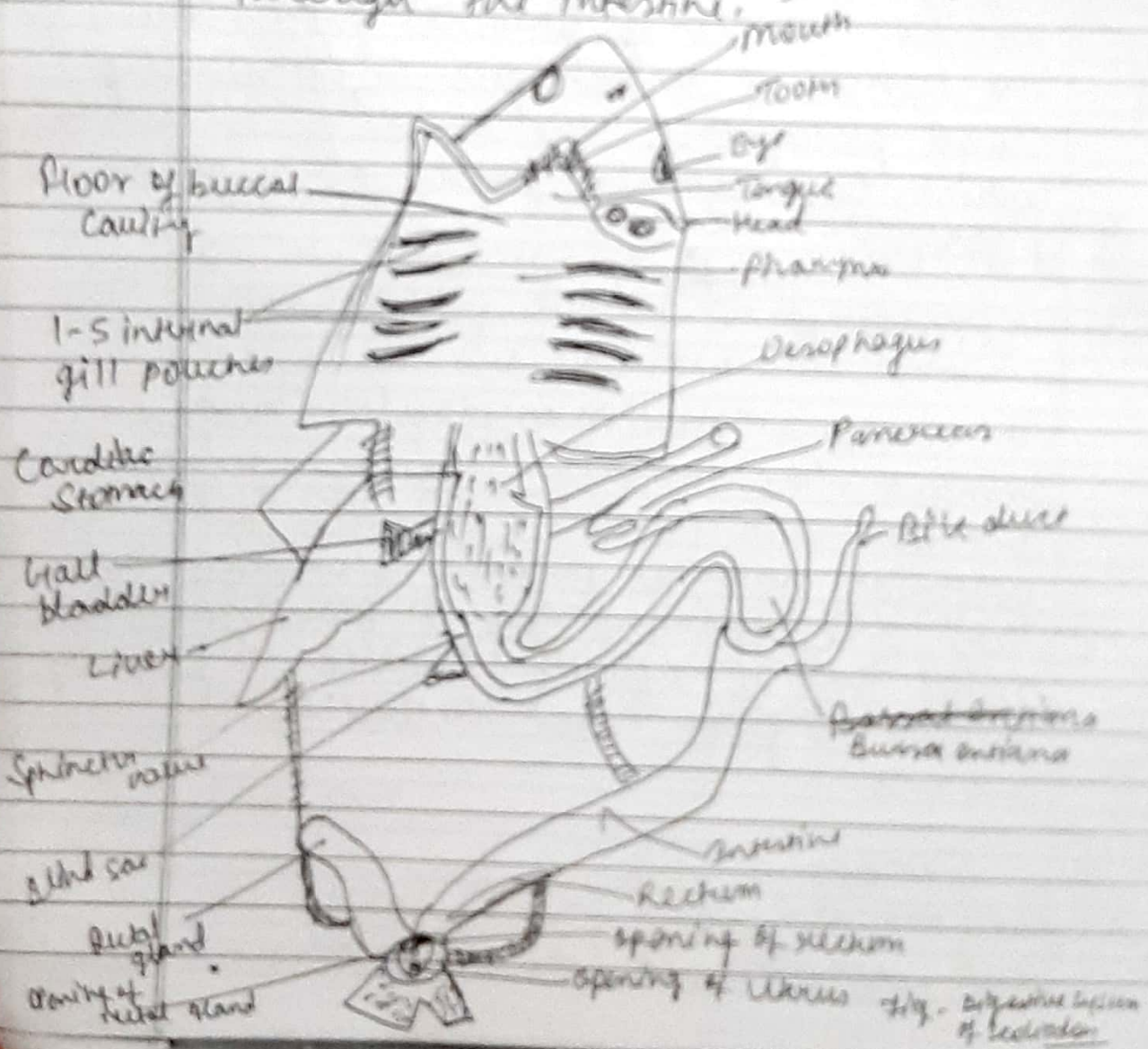
The stomach widens to form J-shaped stomach. The stomach has two regions, anterior with cardiac stomach and posterior narrow pyloric stomach. These two are separated by a blind sac. The distal end of pyloric stomach is slightly dilated to form a sac called bursa entiana.

6. INTESTINE

The stomach leads into the intestine. It is

wide tube. The mucous membrane is folded to form a scroll valve. One edge of the scroll valve attached to the inner wall of the intestine and the other edge is rolled up on itself longitudinally making an anticlockwise spiral valve of about two and half folds. In a cross section it looks like a watch spring. It has two functions:

- a) It increase area of absorption and
- b) It prevents the rapid flow of food through the intestine.



7. RECTUM

Intestine opens into the rectum which opens into the cloaca.

Digestive glands:-

① Liver

The liver is formed of two lobes. The lobes are united anteriorly and free posteriorly. The right lobe contains the gall bladder. A bile duct arise from the gall bladder and it opens into the intestine. The liver has three function

- ① It secretes bile
- ② It store glycogen &
- ③ It destroys worn out RBC

Pancreas

The pancreas is located in the loop of the stomach. It is bilobed. The pancreatic duct arising from the pancreas opens into the intestine opposite to the bile duct.

Physiology of digestion

The scoliodon is carnivorous. They feed on other fishes, crustacean and molluscs. The prey is engulfed and pass down to the stomach unchanged. The mucus

membrane of buccal cavity produces mucin which lubricate the food digestion begins in the stomach as the mucous membrane of the stomach secrete the gastric juice which HCl and pepsin.

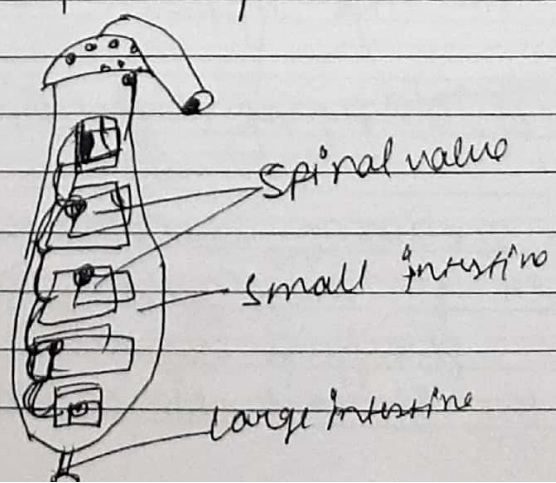
The HCl

- ① destroy bacteria coming along with the food
- ② activate the hard part of the prey.

The pepsin converts proteinous part of the prey food into syntonin, protease and peptones.

The pyloric stomach and scroll valve activate the pancreas. The bile and pancreatic juice mix with the food in the intestine. The bile juice makes the food alkaline and activates the inactive proenzyme of pancreatic juice into the active enzymes. The pancreatic juice contains trypsinogen (Trypsin), Amylopsin & lipase which digest protein, carbohydrate and lipid respectively.

Fig - Small intestine of dog fish cut open to show spiral valve



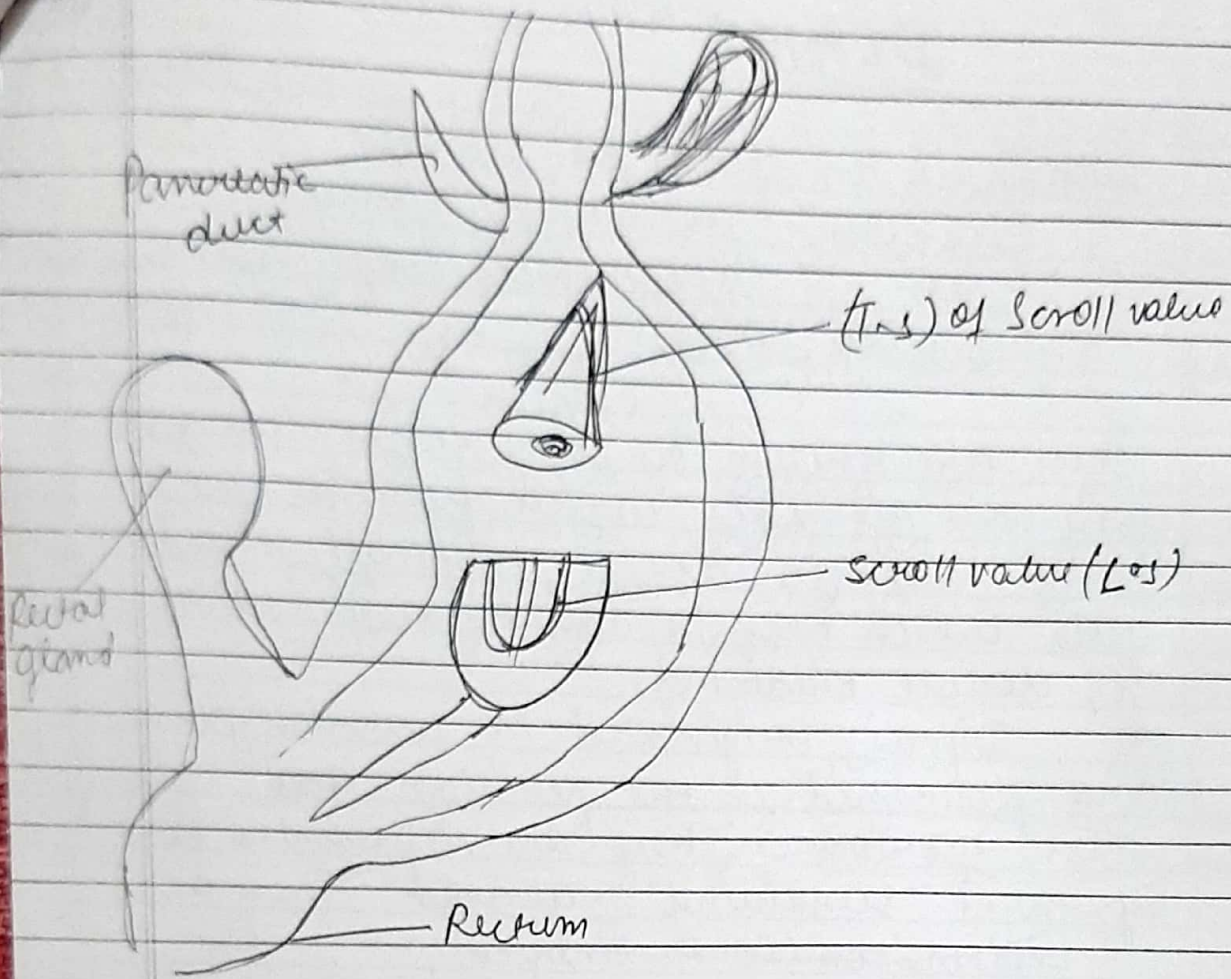


Fig: - L.S of AC of scorpion showing scroll value

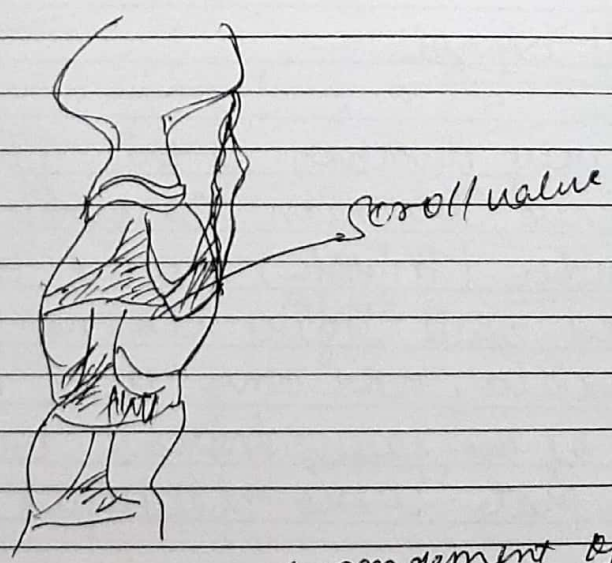


Fig - Arrangement of scroll value

ELECTROPHORESIS

(CCS 1999)

Q. 2.13. Write a short note on electrophoresis.

Molecules or macromolecules may be separated in an electric-field if they are charged to different extents. The mixture of compound is applied to supporting films which dip into two

containers filled with a salt solution. One of the containers holds a cathode, the other an anode. On passing an electric current, the negatively charged molecules migrate to the anode and the positively charged molecules to the cathode. Paper, agar and starch are examples of substances which may be used as supporting films.

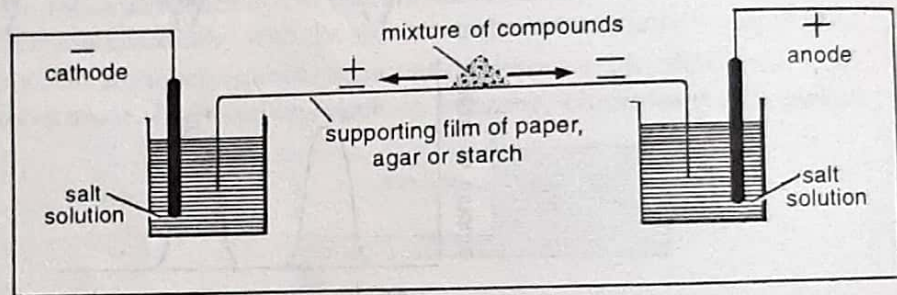


Fig. 2.13. Electrophoresis.

The rate of migration of a molecule in an electric field is determined by its size and the number of charged groups per molecule. The electrophoresis method is used in the separation of proteins, nucleic acids and their building blocks.

Some of the common types of techniques of electrophoresis, which are currently used in cell biology, are the following :

1. **Moving-boundary electrophoresis** (used for proteins).
2. **Gel or zone electrophoresis** (used for proteins).
3. **Discontinuous electrophoresis** (used for isolation of proteins of plasma membrane).

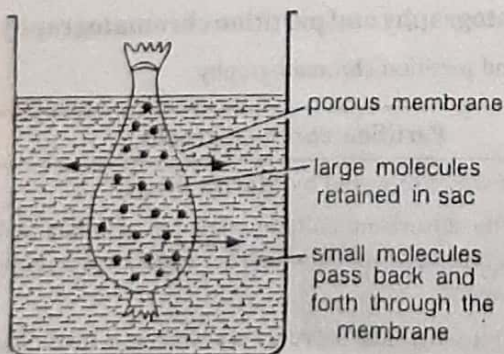


Fig. 2.14. Dialysis.

4. **SDS-PAGE or Sodium dodecyl sulphate-polyacrylamide gel electrophoresis** (used for separating and sizing macromolecules such as proteins, e.g., membrane proteins, protein component of cytoskeleton, etc.).

5. **Maxam-Gilbert technique** (used for separation of polynucleotide fragments of RNA and DNA).

6. **Immuno-electrophoresis** (used for antigens and antibodies).