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B.Sc HONS Part II Paper - IV (ZOOLOGY)

Topic - Give a Comparative account of gastro Intestinal tract in vertebrate group.

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Q. Give a comparative account of the gastro intestinal tract in vertebrate group.

Ans. The embryonic archenteron becomes the living of the adult digestive tract and of all its derivatives. The stomodaeum becomes the adult buccal cavity, the proctodaeum forms either a small part near the anus or it give rise to an external portion of the cloaca.

Modification In gastro Intestinal Tract :

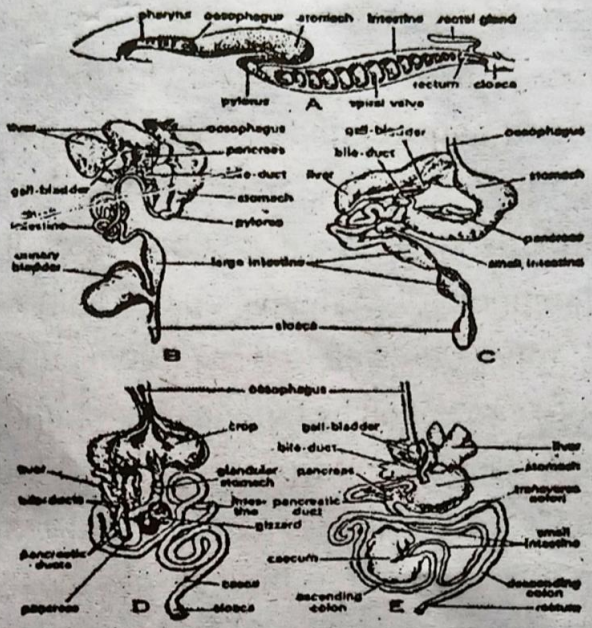
1. Pisces : The alimentary canal regions are buccopharynx oesophagus, stomach, intestine and rectum. There is no distinct differentiation between oesophagus and stomach. Stomach is absent in Diponi, Holocephali, Hippocampus etc. The intestinal bulbs does not play any digestive role because gastric glands are absent. The rectum is distinguishable by having ileocrectal value at the junction of intestine and rectum in many fishes. In fishes, the liver is a large bilobed organ. The gallbladder is present in almost all forms except a few sharks.

2. Amphibia : The aesophagus is a simple tube and is not sharply distinguishable from the stomach. Stomach is simple with folded mucous layer. Simple tubular gastric glands open in the folds. Intestine is short in adult amphibians and is marked off from the stomach by having a well developed pyloric sphincter. The liver is attached to the duodenum and stomach by gastrohepatic ligament.

3. Reptiles : The stomatch is tubular, small intestine is rather short. The large intestine is wide and leads to short caecum. The cloaca is subdivided into three incomplete chambers. The upper chamber or coprodaeumis meant for reaces. The middle chamber or urodaeum receives the ureters and the genoducts. The lower chamber or proetodaeum which terminates in cloacal sphincter.

4. Birds : The pharynx leads into a wide oesophagous, which produces a large eceptacle (crop) is grain eating birds, Oesophagous leads into the stomach which is divided into a tubular glandular and a

muscular gizzard. The gizzard is highly muscular in grain eating forms, while in carnivorous forms it is simple and assumes the characters of normal stomach. The duodenum and the coiled intestine are short in carnivorous birds, but in grain eating varaties these are longer. The duodenum receives the pancreatic and bile ducts. Two small blind caeoca are present at the function of the ileum and rectum. The brusa fabrieci (cloacal thymus) opening into the proctodaenum helps young birds to protect against local infection.



5. Mammals : In mammals the oesophagus is long and it passes through the diaphragm. The portion below the diaphragm is covered with visceral peritioneum which is lacking from the upper part. The stomach lies transeversely and has a large funds, in many ruminants stomach has four chambers, a rumen, reticulum, omasum and an abomasum. It is claimed that the first three chambers are modification of the oesophagus and abomasum constitutes the cardiac, fundic and pyloric part of the stomach but it has been shown embryologicaly that all chamber are modified regions of the stomach. In camels there is no omasum the rumen and reticulum have pouch-like water cells which were once belived to store water but they are probably digestive. The first part of the small intestine is the duodenum, it has many folded villi.

Behind the duodenum is an ileum, but in mammals it has more anterior jejunum and posterior ileum. Acecum at the jucntion of the large and small intestine is present in most mammals. Caecum is absent in sloths cetacea and few carnivores. Large intestine has a large dimeter than small intestine. The large intestine is concerned with bacterial purifaltion