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Digestive system of teleost

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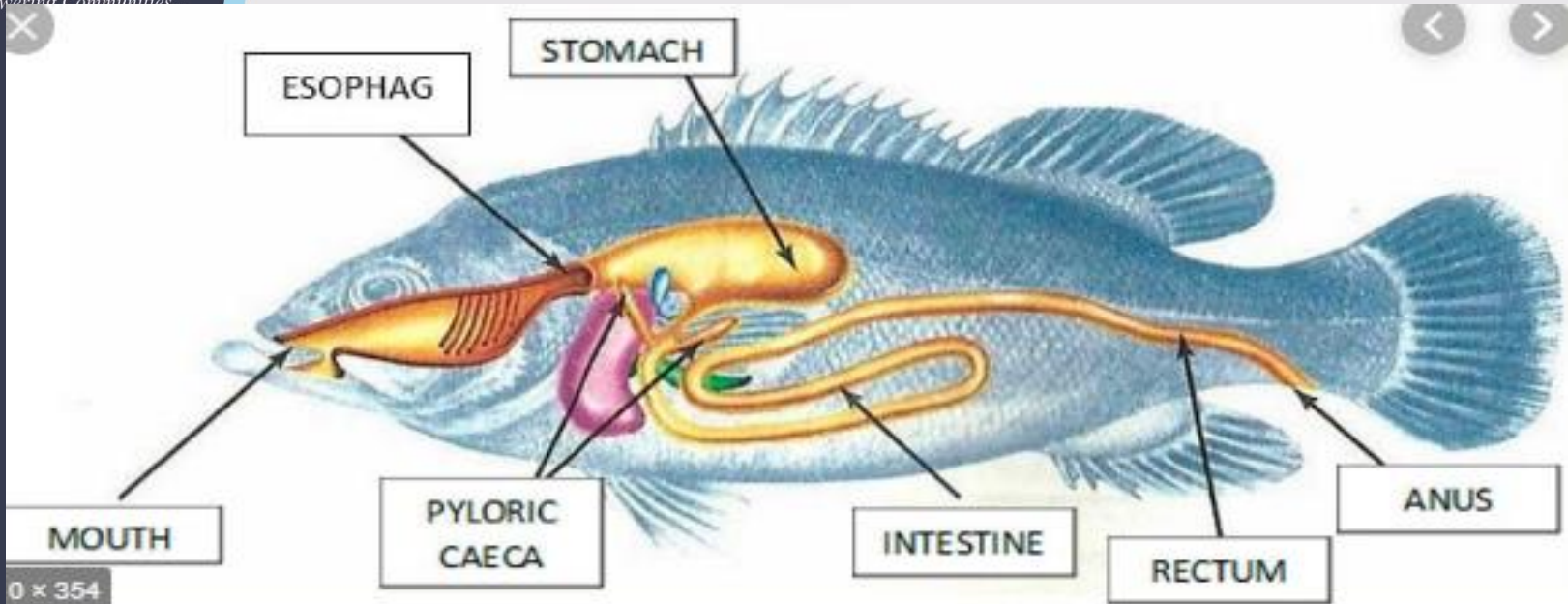
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The digestive system consists of alimentary canal and its associated glands



Teleost Digestive System





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Parts of Alimentary Canal:

The alimentary canal of fish consists of **mouth**, which opens into buccopharynx, which in its turn opens into the **oesophagus**.

The oesophagus opens into the **stomach/intestine**.

The lips, buccal cavity and pharynx are considered as **non-tubular** part whereas the oesophagus stomach/intestinal bulb, intestine and rectum are tubular in nature and distinguished as **tubular part** of the alimentary canal.



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Esophagus

Esophagus forms the beginning of the gastro intestinal tract.

In general the oesophagus is distensible to facilitate swallowing of large sized prey.

The oesophagus is a short and narrow in case of Herbivorous and omnivorous fishes. (*Cyprinus carpio*, *L. rohita*, *Tor tor* etc.

A large no. of mucus – secreting cells are scattered in the mucosa and taste buds are also present in some species.



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Stomach

Frequently in literature the fishes are classified as stomach or stomach less fishes.

85% telecast have stomach 15% had no stomach.

The stomach too shows various adaptations one of which is shape.

In carnivore the stomach typically is straight, elongate for example in gars (*lepisosteus*), bowfins (*Amia*), Pikes (*Esox*) and barracudas (*sphyraena*).



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In omnivorous species, the stomach is most often **sac-shaped.**

A very special adaptation is the modification of the stomach into a grinding organ as in the sturgeons (Acipenser) gizzard shads (Dorosoma) and mullets (Mugil).

Here the stomach is reduced in overall size but its wall greatly thickened and muscularized.

The lining too is heavily strengthened with connective tissue and the lumen is very small.

The organ is not for storage, mixing and primary digestion but rather a food grinder.



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Great dispensability is the adaptation of the stomach in the predatory deep sea swallows (Saccopharyngidae) and gulpers (Eurypharyngidae) enabling these fishes to take relatively huge prey.

A remarkable modification of the stomach exists in the puffers (Tetradontidae) which can inflate themselves with water or air to assume often an almost globular shape.

Not all fishes have a stomach that is a portion of digestive tube with a typically acid secretion and a distinctive epithelial lining different from that of the intestine.



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Intestine

The intestine too has many variations.

It is shortened in carnivores such as in the pike perhaps because meaty foods can be digested easily.

Where as in herbivores the intestine is highly elongated and several times the body length of the fish and in carps and certain catfishes.

In sharks and other elasmobranchs the intestine has a coiled layer of absorptive tissue called **spiral valve** which increase absorptive surfaces for the relatively in short intestine.

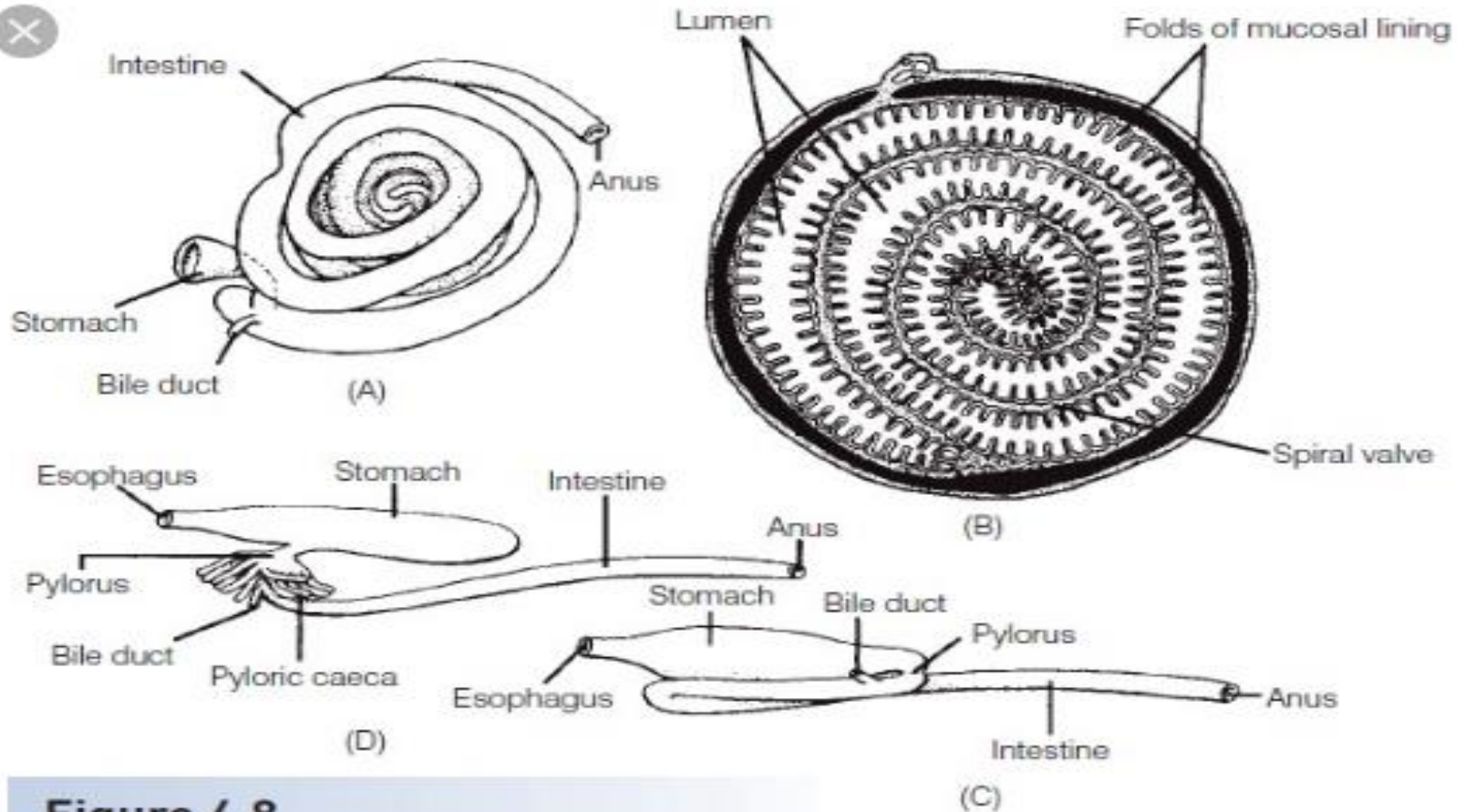
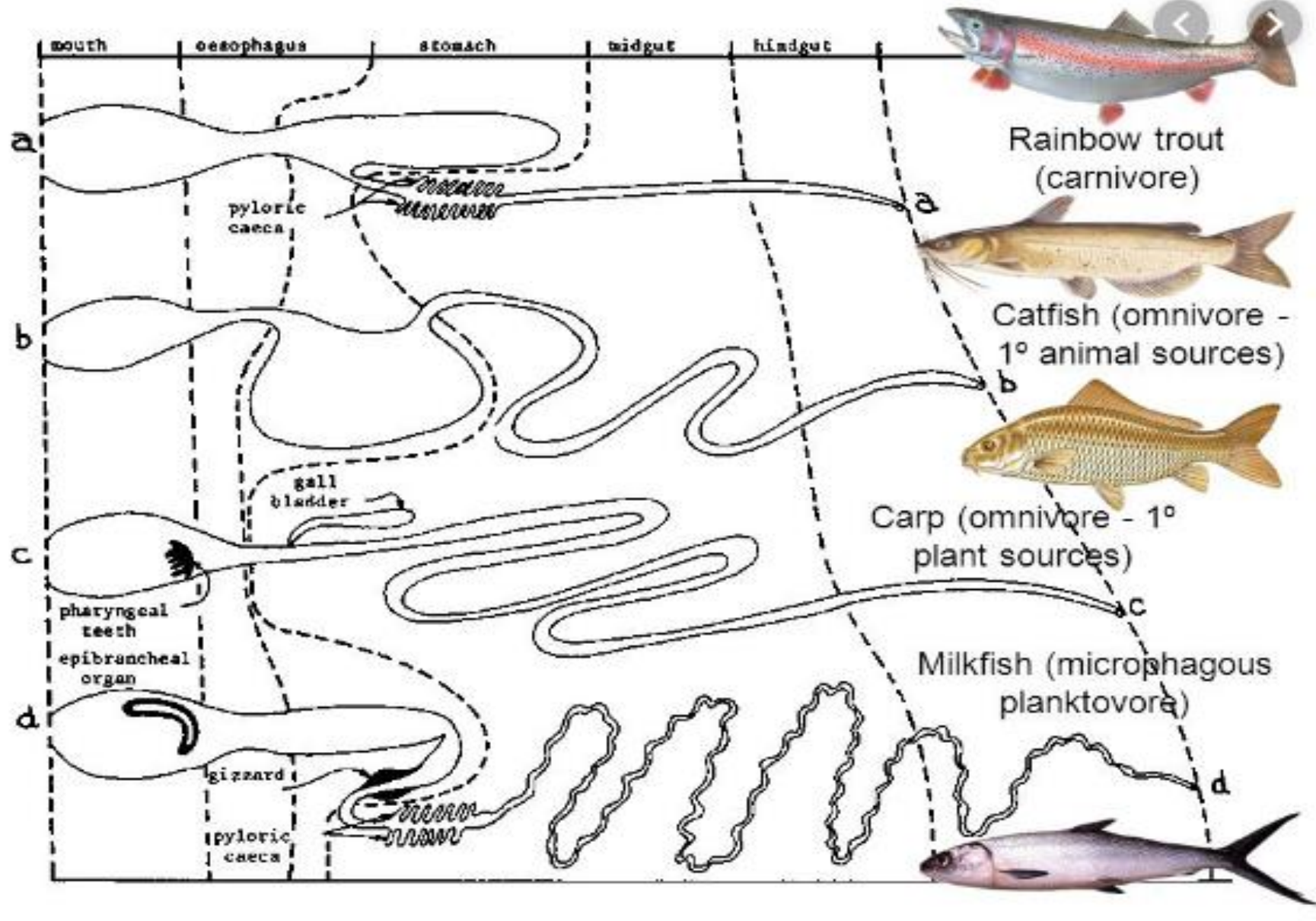


Figure 4.8

Variation in intestinal length and other features among carnivorous and herbivorous fishes. (A) An herbivorous catfish (*Loricariidae*). (B) Spiral valve in cross-section of intestine of a shark. (C) A carnivore, the Northern Pike (*Esox lucius*). (D) A carnivore, a perch (*Perca*). From Lagler et al. (1977).





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Pyloric caeca

(Fishes are only vertebrates that have appendages (Caeca) at the gastro-intestinal junctions). On the intestine of most bony fishes at the pyloric end of the stomach. There may be from one to many blind sacs or pyloric caeca or intestinal caeca.

A few groups such as cat fishes top minnows and pikes lack these structures.

In such groups as flat fishes the pyloric caeca are few usually not more than five (5). In others such as Mackerels, Salmons, the number of these caeca may range to 200 or more.



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Generally caeca of different species vary considerably in size, state of branching and the connection with the gut.

In starfishes the many caeca form a large mass, but only a single duct leads to the intestine.

In salmon, each caecum communicates directly with the gut, the functions of pyloric caeca probably involve both digestion and absorption.





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Rectum

Morphologically there is no distinction between the rectum and intestine, the ilio-rectal valve is present in sciana, tetradon and muracnosox.

ANUS

It is the posterior opening of the alimentary canal or digestive system.

The internal surface of the region near the rectum is covered with an epithelium rich mucous cells.

The anus is made up of an inner circular and outer longitudinal muscle layer.

The circular muscle is thick developed forming sphincter.



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Thank you