

BLOOD-VASCULAR-SYSTEM IN AMPHIOXUS

Introduction:-

With the purpose of transportation of useful and waste substances in the body a system of network is present. Inside the body a transporting medium is present the medium is the blood and the whole system comprised of blood and the network is called blood-vascular system.

Blood-vascular system in Amphioxus:-

This system in Amphioxus is extremely simple due to the lack of heart & presence of few blood vessels. The blood vessels are simple and alike without any differentiation of arteries & veins. The blood is devoid of any respiratory pigment and contains a few white corpuscles.

This blood vascular system can be studied as follows:-

[A] Sinus - Venosus :-

- (i) It is a sac like structure present ventral and posterior to the pharynx.
- (ii) Its wall is thinner and blood collected from different parts of the body are stored here.

[B] ventral - aorta:-

- (i) It is a longitudinal vessel originating from sinus-venosus and running forward mid ventrally beneath the endostyle.
- (ii) It is highly contractile in nature.
- (iii) Numerous paired vertical branches originate from the ventral aorta & run into the primary gill bars of the pharyngeal wall. These are called afferent branchial arteries.

- (iv) At the base of its gill-leaves, each afferent branchial artery is dilated into a small contractile bulbe presumably acting as a branchial heart.
- (v) During its journey, these afferent arteries communicate with similar vertical vessels situated in the secondary gill leaves by means of short connecting branches running through the synapticalae.
- (vi) The vessels of the secondary leaves, thus, don't communicate directly with the ventral-aorta.
- (vii) After running through their respective gill leaves, all afferent branchial arteries as well as the vessels of the secondary leaves dorsally emerge out from pharyngeal wall as efferent branchial arteries.

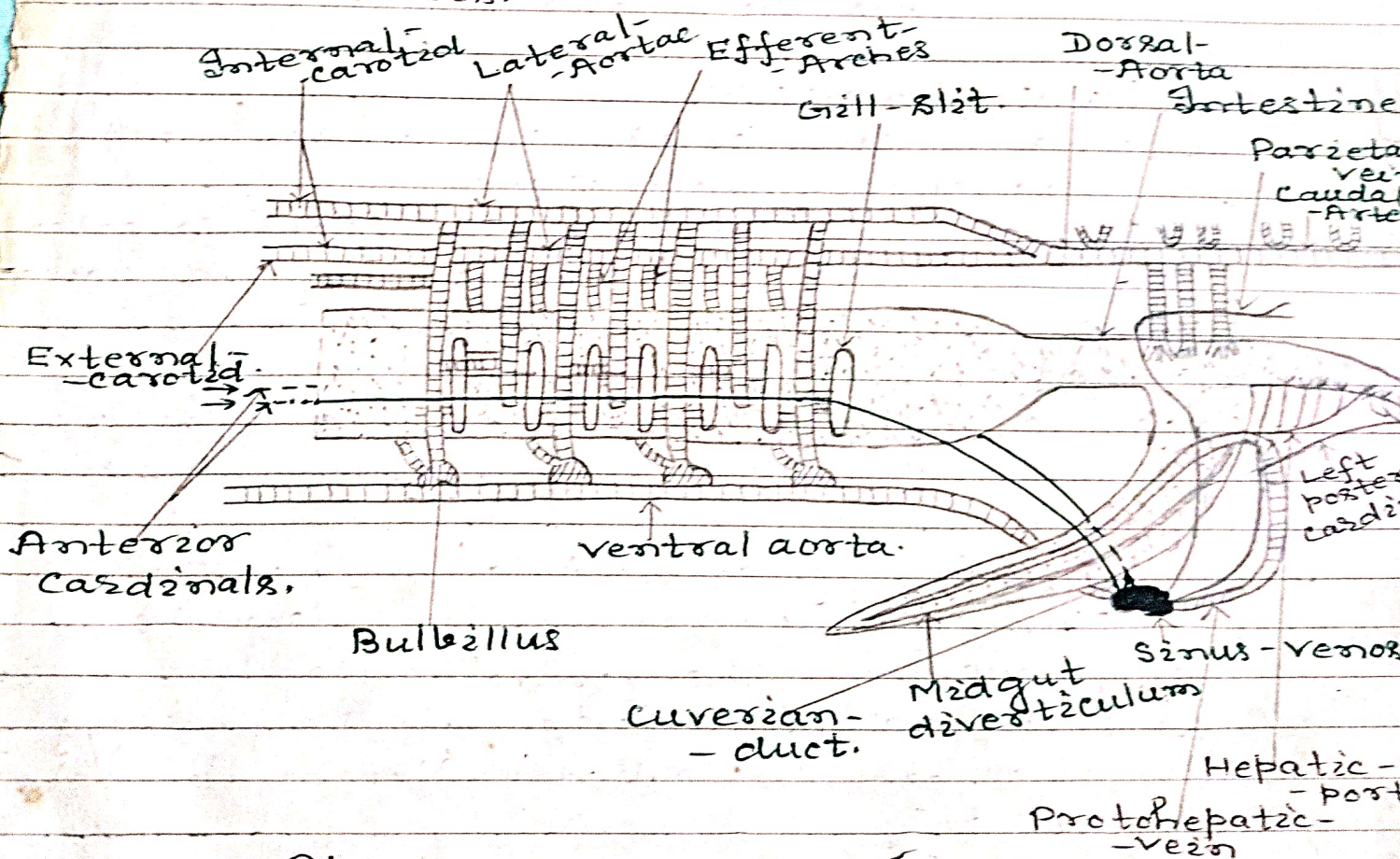


Fig. - Blood-Vascular System of Amphioxus

[C] Dorsal aorta—

- (i) Within each dorsal aorta some blood is carried forward into the region of oral hood and some is carried backwards to the other parts of the body.
- (ii) The anterior portion of the dorsal aortae may be taken as carotid arteries, which end blindly in the snout area.
- (iii) The right carotid extends a slightly more forward than the left one and is somewhat dilated.
- (iv) Posteriorly, the dorsal aortae join together to form a median dorsal aorta. The median dorsal aorta runs back in the rest of the body giving out segmental distributing arteries to the gutwall and to other parts of the body.
- (v) It also continues into the tail as a caudal artery.

Portal - System:—

- (i) From the lacunae of the wall of midgut and hindgut the blood is collected back by extremely short vessels, which join to form a single subintestinal vein. It runs along the mid ventral wall of the gut.
- (ii) At level with the anterior part of the mid gut, the subintestinal vein turns to the right and runs along the ventral border of hepatic - caecum or liver. This is the region that subintestinal vein is often referred as the hepatic portal vein.
- (iii) A short hepatic vein collects the blood from the lacunae of the hepatic - diverticulum and joins the sinus - venosus.
- (iv) The blood from the portal anal or the tail part of the body is collected by

caudal - veins, which join the plexuses of gut wall.

Cardinal - Veins: —

- (i) From the lacunae of the various parts of the body the blood is collected back by segmental collecting vessels, which join to form two pairs of main veins — a pair of anterior cardinal and a pair of posterior cardinal veins.
- (ii) These cardinal veins run in the dorsal wall of the coelom.
- (iii) At level with the posterior end of the pharynx, the anterior & posterior cardinals of each side join to form a ~~single~~ single vertical vein called the duct of cuvier.
- (iv) Both ducts of cuvier extend ventrally across the coelom and join the sinus-venosus.

Peculiarities of circulatory ~~sto~~ system of Amphioxus: —

- (i) The heart is absent.
- (ii) The wall of blood vessels is contractile & ventral blood vessel pumps the blood.
- (iii) The dorsal aorta is divided into a pair of vessels anteriorly.
- (iv) The position of ventral aorta in the posterior part of the body is taken by subintestinal vein.
- (v) Blood circulates anteriorly inside ventral - aorta & posteriorly inside dorsal aorta.

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