

## **Respiratory and circulatory System of Nereis**

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### **Respiratory System of Nereis**

Gills are absent in Nereis . The function of respiration is taken over by the lobes of parapodia and dorsal integument. For this reason, these regions are richly supplied with blood vessels.

The physiology of respiration is known in Nereis virens. It lives at a depth of 20-30 cm and in almost oxygen-free sand. The animals draw water by producing water current while gaseous exchange takes place through the vascularised regions of the parapodia.

When the oxygen pressure in surrounding water is equal to the oxygen pressure of blood, gaseous exchange ceases. This arrest of respiratory exchanges is possible by restricting the blood flow only to the dorsal and ventral vessels. Nereis draws nearly 75% of the oxygen from water.

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### **6. Circulatory System of Nereis:**

Blood of Nereis is red in colour. The constituents of blood are plasma and corpuscles. Haemoglobin remains dissolved in plasma and its quantity is 8-9 mg per cubic millimetre. The blood flows through definite blood vessel.

#### **The chief blood vessels are:**

##### **A. Longitudinal vessels:**

There are three longitudinal vessels running along the entire length of the body.

**These are:**

**1. Dorsal blood vessel:**

This vessel serves as the main collecting vessel and runs mid-dorsally from one end of the body to the other end above the alimentary canal. It carries blood from posterior to anterior end.

**2. Ventral blood vessel:**

It is the main distributory vessel running mid-ventrally from one end of the body to the other below the alimentary canal. It conveys blood from anterior to posterior end.

**3. Neural blood vessel:**

This is a delicate longitudinal vessel accompanying the ventral nerve cord.

**B. Transverse or commissural vessels:**

This dorsal vessel is connected to the ventral vessel in each segment by two pairs of transverse vessels. But this link is not direct.

Transverse vessels originating from the ventral vessel first give off branches to the parapodia, alimentary canal and adjoining parts.

Some of these branches ramify to form networks of fine vessels inside the parapodial lobes and in the integument of the dorsal surface. Then from these extensive capillary networks, stout vessels are formed which open into the dorsal vessel.

**C. Segmental intestinal vessels:**

The ventral vessel gives off two pairs of intestinal vessels in each segment to form capillary network in the gut wall. From there blood is returned to the dorsal vessel by another two pairs of intestinal vessels.

**Mechanism of Blood Circulation:**

Blood remains in constant circulation through the vessels by means of contractions which are peristaltic in nature. Waves of contractions transmit along the walls of the vessels to drive the blood. A series of ring-like muscle fibres round the walls of the blood vessels at short intervals aid in contraction.

The contractions of the dorsal vessel are the most powerful. Dorsal vessel is the main collecting vessel and blood flows through it from posterior to anterior end. Whereas the flow of blood is in opposite direction through ventral vessel and by transverse and intestinal vessels it sends blood to the different parts of the body.