Class 7 Biology Transportation in Animals and Plants

Introduction

Introduction

- Transportation is the characteristic property of living beings.
- Transportation can be defined as the movement of any substance from one place to another.
- Water and nutrients required for all metabolic activities should be transported in the body of plants and animals.

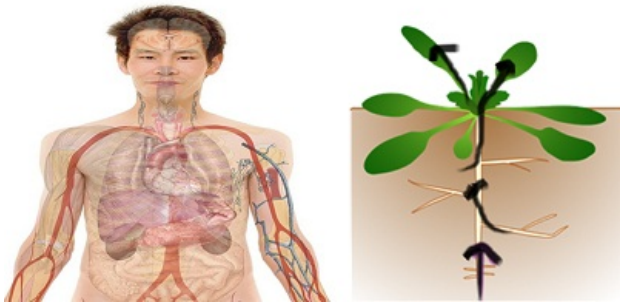

Fig. transportation in animals and transportation in plants

- The waste material or excretory products should also move to the region of excretion.

Class 7 Biology Transportation in Animals and Plants Transportation in animals

Transportation in animals

- Transportation in animal takes place through circulatory system which includes blood, blood vessels and heart.
- Blood is the red fluid which flows throughout the body and carries oxygen to all the cells of the body from the lungs and car bon dioxide from all the cells to the lungs.
- Blood contains white blood cells, red blood cells, platelets and plasma.
- Tube like structure through which carry blood to cells, tissues and organs are called as blood vessels.
- Two special blood vessels are arteries and veins.
- After reaching the organs, the arteries divide in to small branches called as capillaries.
- Heart in another component of circulatory system which is also known as pumping organ.
- Heart consists of four chambers separated by a partition to avoid mixing of oxygenated and deoxygenated blood.

Fig. Transportation of blood in human being

Class 7 Biology Transportation in Animals and Plants Blood

Blood

Blood is the red fluid which flows throughout the body.

Functions of blood-

Carries oxygen, required for respiration from lungs to the cells of the body.
Carries carbon di oxide, waste product of respiration from cells of the body to the lungs.
Aid in transporting waste products from the whole body to the excretory organ.
After digestion of food in the various parts of alimentary canal, the digested food from small intestine is carried to all the cells of the body.

Composition of blood- Blood is composed of three types of cells and a liquid part called plasma.

Three types of cells are

Red blood cells –

* Do not contain nucleus.

* Blood is red because of the presence of a red pigment called hemoglobin.

* Hemoglobin has high affinity to bind with oxygen and carrying oxygen from lungs to all the cells of the body.

* In the absence of hemoglobin, it is difficult to provide oxygen to all the cells of the body.

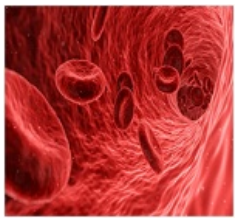

Fig. Red blood cells

White blood cells-

* Contain nucleus, some white blood cells contain two to three lobes of nucleus.

* Fight against germs and foreign infectious organisms and kill the organisms entering the body and thus protect the body.

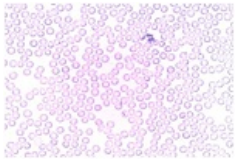

Fig. Microscopic view of white blood cells

3 ***Platelets-***

* Do not contain nucleus.

* During bleeding, platelets help the blood to form dark red clot and thus stop bleeding.

Class 7 Biology Transportation in Animals and Plants — Blood vessels

Blood vessels

Blood vessels are the tube like structures which carry the blood through cells, tissues and organs.

Blood rich in oxygen reach heart first from lungs and then to all the cells of the body by blood vessels.

Blood carrying carbon di oxide from the cells reach heart and then to the lungs for removal.

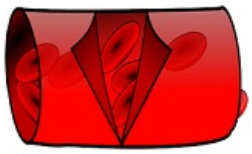

Fig. Blood vessels carrying red blood cells

Two types of blood vessels are arteries and veins which are connected to the heart for transporting blood.

- ***Arteries –***

Carry blood rich in oxygen from the heart to all the cells of the body.
The pressure exerted by the arteries while blood leave heart is rapid and thus wall walls of arteries are thick.

- ***Veins –***

Veins carry blood rich in carbon di oxide from all the cells of the body to the heart.
The pressure exerted by the walls of the veins is less and have thin walls.
Valves present in the veins ensure that the blood flows only towards the heart.

Fig. Flow of blood through blood vessels, arteries are colored red and veins are blue connected to the heart

The arteries divide in to extremely small thin branches on reaching the tissues. These small branches are called as

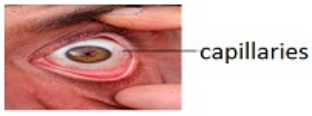

Fig. On reaching the eye, arteries divided into capillaries

- The regular throbbing of the arteries is called
- Throbbing in arteries is due to the blood flow in the arteries.

- Pulse can be felt by touching the middle and index finger of the right hand on the inner side of the left wrist.
- Pulse is usually our **heart beat**.
- The number of times heart beats per minute is called **pulse rate**.
- The pulse rate of a normal resting person is 72 to 80 beats per minute.

Fig. Pulse rate

Class 7 Biology Transportation in Animals and Plants — Heart

Heart

- Known as the pumping organ.
- Beats continuously to pump blood.
- Located in the chest cavity.
- The lower end is slightly titled towards the left.
- To avoid mixing of oxygenated and deoxygenated blood, heart has four chambers.
- The four chambers of heart are right atrium, left atrium, right ventricle and left ventricle.
- The partition between the chambers helps to avoid the mixing of blood.
- Oxygenated blood enters left atrium and passes to left ventricle and is transported to all the parts of the body.
- Deoxygenated blood enters right atrium and then right ventricle and from right ventricle blood carries carbon di oxide to the lungs.

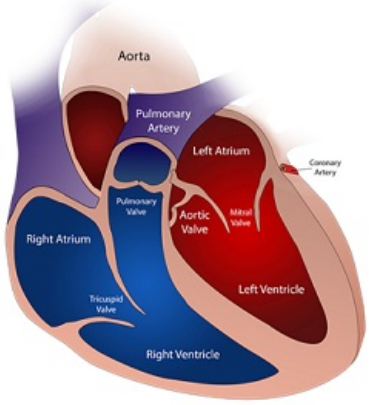

Fig. Human heart

Heartbeat

- The rhythmical contraction and expansion of heart muscles constitute heartbeat.
- Doctors check the heart beat with the help of a device called as stethoscope.
- Stethoscope has a chest piece, two ear pieces and a tube for joining the parts.
- Stethoscope amplifies the sound of the heart.

Fig. Stethoscope

- Rate of heartbeat is the pulse rate per minute.
- Heart beats to circulate blood to all the parts of the body.
- Some animals such as sponges, hydra does not have blood.
- The water in which they live carries oxygen and food when the water enters the body.
- The water when leaves the body carries away carbon di oxide and other waste materials from the body.

Fig. Sponges

Class 7 Biology Transportation in Animals and Plants — Excretion of wastes

Excretion of wastes

The process of removal of the toxic waste products produced due to cellular activities is called excretion.

The parts of the body of organisms involved in the process of excretion are called excretory system.

The human excretory system consists of – kidney, ureter, urinary bladder, urethra.

Kidney-

- Bean shaped organ.
- Blood when reaches kidney contains both harmful and useful substances.
- The useful substances are absorbed by the body and the wastes dissolve in water and form **urine**

Ureter-

- Tube like structure.
- Passes urine from the kidney to the urinary bladder.

Urinary bladder-

- The urine passes from the kidney to the urine bladder is stored in the bladder.

Urethra-

- Muscular tube containing a small urinary opening.
- Urine passes out through the small opening of the urethra.

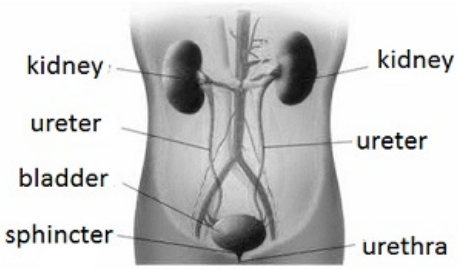

Fig. Human kidney

Transportation in plants

Plants absorb water and minerals from soil by roots and transport to the leaves.

Fig. Water and nutrients are transported to all the parts of the plant

- Leaves prepare food for plants using water and carbon di oxide.
- Food must be available to all the parts and cells of the plants because plants get energy from food by breaking down of glucose.
- Plants have root hairsin roots for increasing the surface area of the roots.
- Surface area is increased to absorb more water and nutrients.
- A group of special cells forming **vascular tissue** transport water and nutrients to all the cells of the plants.
- Two types of vascular tissues are **xylem** and
- The xylem vessels form a continuous network of channels with roots, stem, leaves and branches of the plant through which water is transported.
- The food is transported to all the parts of the plant by phloem.

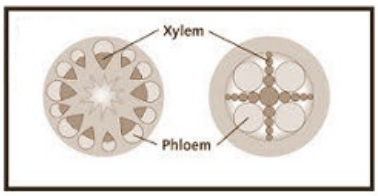

Fig. Xylem and phloem

Class 7 Biology Transportation in Animals and Plants Transpiration

Transpiration

- The process of release of water in the form of water vapor is called transpiration.
- Some amount of water remain unused by the plant is released by**stomata** present on the leaves.
- Advantages of transpiration-

Generates suction pull which can pull water to great heights by xylem in very tall plants .
It cools the plant.

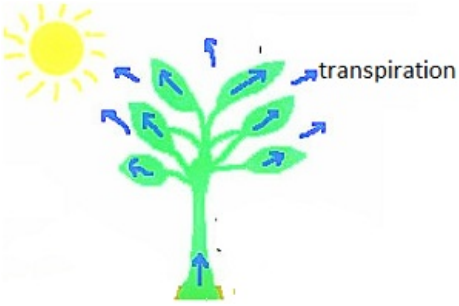

Fig. Transpiration through stomata of leaves