

# 14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

## Learning Objectives

At the end of this lesson the students will be able to:

- ❖ Learn how the water and minerals move from soil to the plant.
- ❖ Learn how prepared food by the leaf is translocated to various parts of the plant.
- ❖ Understand the role of osmosis and transpiration.
- ❖ Understand the composition of blood.
- ❖ Identify and explain the structure of heart and associated blood vessels.
- ❖ Understand systemic, pulmonary and coronary circulation.
- ❖ Differentiate the events of the cardiac cycle.
- ❖ Know about blood pressure and heart beat.
- ❖ Understand the use of stethoscope and sphygmomanometer.
- ❖ Identify the different blood groups.
- ❖ Understand the role of lymphatic system.

## Important Points and Notes

- ◆ Dews are water droplets on the leaves of grass seen in the early mornings, when the climate is humid and excess of water is present in the plants, the excess water is exudated in the form of liquid. This is due to root pressure. This phenomenon is called **Guttation** which takes place through specialized cells called **Hydathodes**.

- ◆ Mammalian RBC lack nucleus and makes the cells biconcave and increase surface area for oxygen binding, loss of mitochondria allows the RBC to transport all the oxygen to tissues, and loss of endoplasmic reticulum allows more flexibility for RBC to move through the narrow capillaries.
- ◆ **Anemia:** Decrease in number of erythrocytes.
- ◆ **Leucocytosis:** Increase in the number of leukocytes.
- ◆ **Leucopenia:** Decrease in number of leukocytes.
- ◆ **Thrombocytopenia:** Decrease in the number of thrombocytes.
- ◆ Closed circulatory system was discovered by William Harvey (1628) who is regarded the Father of Modern Physiology.
- ◆ **Heart chambers in vertebrate animals**
- ◆ **Two chambered:** Fishes
- ◆ **Three chambered:** Amphibians
- ◆ **Incomplete four chambered:** Reptiles
- ◆ **Four chambered:** Aves, Mammals and Crocodiles (Reptile)
- ◆ **Neurogenic and Myogenic Heart Beat**
- ◆ Neurogenic heart beat is initiated by a nerve impulse caused from a nerve ganglion situated near the heart. e.g. Annelids, most arthropods
- ◆ Myogenic heart beat is initiated by a specialized group of modified heart muscle fibres. e.g. Mollusca and Vertebrates
- ◆ Atrioventricular bundle was discovered by His (1893). So is called Bundle of His.