**25TH MAY, 2020 JESUS AND MARY SCHOOL & COLLEGE MODULE 2**

**CLASS - 8**

**SUBJECT- BIOLOGY**

**CHAPTER- TRANSPORT OF FOOD AND MINERALS IN PLANTS**

**Explanation of Transport of water and mineral:-**

**The transport of water and minerals in plants occurs at three levels:-**

**1. Absorption of water and minerals in plants by Root hairs:**

Water and minerals are absorbed from the soil by specialised cells, the root hairs. It is covered with a very thin semi-permeable cell membrane and is filled with cell sap.

**Adaptations in root hairs for water absorption:-**

The root hairs are especially adapted for absorption of water because:

* Semi -permeable membrane of unicellular root hair permits water and mineral molecules to enter into the cell sap but does not allow them to come out
* Cell sap in the root hairs has higher salt concentration than the surrounding soil water.
* Large vacuole can absorb much water.
* The root hairs provide a large surface area for absorption.

**Methods of Absorption:-**

Root hairs absorb water by diffusion and osmosis and minerals by active transport;-

1. **Diffusion:**

Diffusion is a physical process that refers to the net movement of molecules from a region of high concentration to one of lower concentration without using any energy. This is also called passive transport. Water from the soil enters the root hair by simple diffusion because concentration of water in soil is more than that in cell sap of the root hair.

**Example of diffusion:** Sugar gets dissolved evenly and sweetens the water without having to stir it.

1. **Osmosis:**

Osmosis is the movement of water through a semi permeable membrane from a region of low concentration. The cell membrane of root hairs acts as a semi -permeable membrane through which water molecules from soil enter the cell sap.

Example: When you keep raisin in water ,the raisin get puffed.

1. **Active transport:**

Active transport is the movement of molecules across a membrane from a region a lower concentration to a region of higher concentration against the concentration gradient . Energy is used for this process.

**2. Movement of water through cortex cells:**

Water absorbed by root hairs moves through the cells of cortex of root by cell-to-cell osmosis, till it reaches the xylem vessels present in the central part of the root.

**3. Conduction of water or Ascent of sap:**

The upward movement of water from roots to the aerial parts of a plant is known as an ascent of sap.

The water absorbed by root is also called sap because it is actually a dilute solution of minerals, it starts ascending upward through xylem vessel from root to the leaves.

**Explanation of Root pressure:-**

In plants , root pressure is the force that help to drive fluids upward into the water conducting vessels (xylem).

Root pressure is actually hydrostatic pressure that develops due to the accumulation of solutes in xylem .The water then diffuses into xylem of roots increasing root pressure. This pushes the xylem sap to rise upward a few meters in the stem and leaves.

**Explanation of Transpiration:**

Transpiration is the process in which plants release the water in the from water vapour the aerial parts of it . Only 1-2% of water absorbed by roots is used by the plant. A large amount of water(about 99%) is lost by plants by transpiration.

Factor affecting transpiration:-

The rate of transpiration is affected by following factors:

* **Temperature:-** Plants transpire more rapidly at higher temperatures because water evaporates more rapidly as the temperature rises.
* **Light :-** Plants transpire more rapidly in the light than in the dark .
* Humidity decreases transpiration rate
* Speed of the wind increase the rate of transpiration.

**Importance of Transpiration:-**

* Cools the surface of the leaves.
* Helps in growth and development of the plants.
* It help in the upward movement of water and minerals from roots of the leaves.

**Importance of minerals:**

Mineral nutrition is defined as the naturally occurring inorganic nutrient found in the soil and food that is essential for the proper functioning of animal and plant body.

More than 60 element are found in different plants .But only 17 elements are absolutely necessary for normal growth and development of plants .They are called essential elements while rest are called non essential elements.

Depending upon the quantity of essential elements required by plants , these elements are divided into two categories:-

1. Macornutrints:- Macronutrients are required in large quantites. They are carbon, hydrogen , oxygen, nitrogen, sulphur, phosphorous, calcium, potassium and magnesium.
2. Micronutrients:-Micronutrients are required in very small quantity by the plants. They are also called trace elements. Iron , manganese , copper,boron, zine, molybdenum, chlorine and nickel.

**WORKSHEET 2**

1. Define the term ascent of sap?
2. Explain root pressure and its role in plants?
3. What is osmosis?
4. Define the term diffusion with explain.
5. Write the importance of transpiration?
6. Write the difference between active and passive transport.
7. Why do plants lose so much of water?
8. What is the difference between diffusion and osmosis .?
9. Give the functions of Root hairs?
10. What is the transpiration?

**Note- Please do all this work in your “Copies” OR “Notebooks” which will be checked when school reopens. Please consider this important.**

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