Brainbox learn easy

Chapter 11

TRANSPORT IN PLANTS

Water movement up a plant:

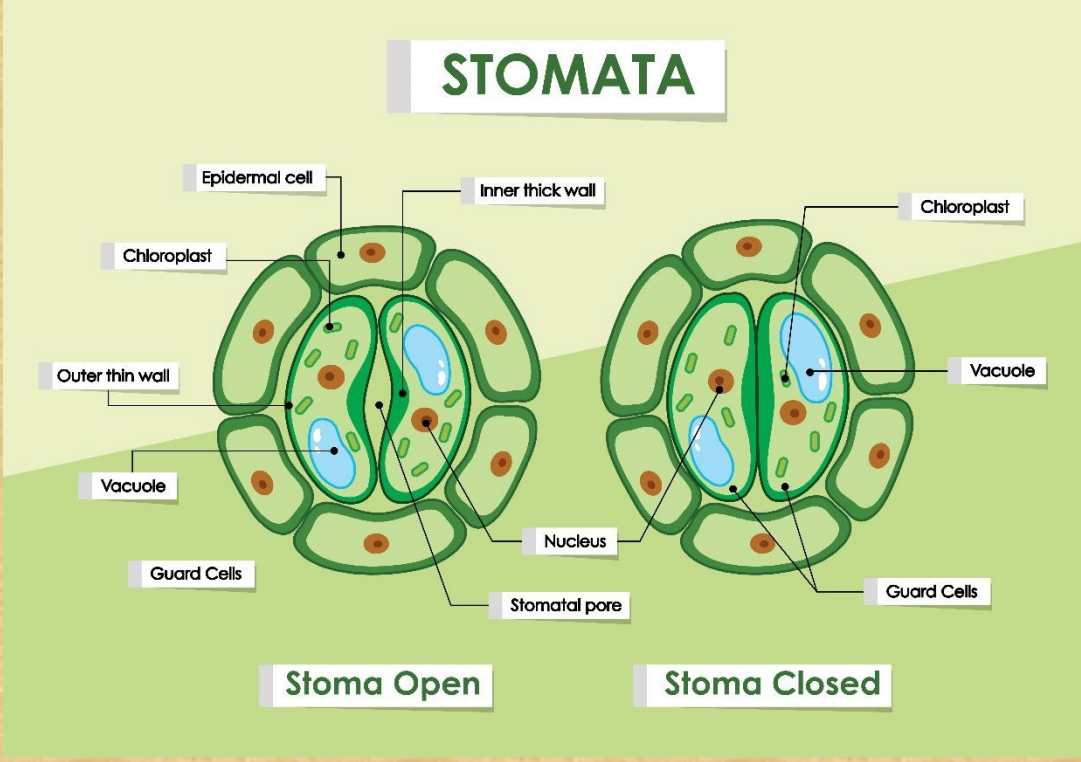
Water is pushed to small height in stems by the positive pressure; this positive pressure is called Root pressure.

- On cutting the stem horizontally near the base with a sharp blade early in the morning.
- Some drops of solution ooze out of the cut stem, this comes due to root pressure.
- We can fix the rubber tube and collect the solution and also can measure the rate of exudation.
- We can observe root pressure at night and in the early morning excess of water is lost in the form of liquid drop less through special opening of veins called hydathodes this process is called Guttation.
- Root pressure can push water up to small heights so it is useful for water transport in small plants.
- Root pressure cannot much helpful in transportation in tall plants but helps to regeneration of broken water column in tall plants.

Transpiration:

The most researches agree that water is mainly pulled through plant, the driving force for this process is transpiration (Evaporative loss of water through stomata). This is referred to as cohesion – Tension transpiration pull model.

Transpiration mainly occurs through stomata.



Transpiration is effected by temperature, light, humidity, wind speed. Internal factors like,

- Number and distribution of stomata.
- Water status of plant canopy structure.

Following properties of water helps in transpiration.

- Cohesion – Mutal attraction between water molecules.
- Adhesion – Attraction between water and walls of xylem.
- Surface tension – Water molecules in liquid phase attract each other than in gas phase.

These properties give high tensile strength to water. i.e., ability to rise in capillary.

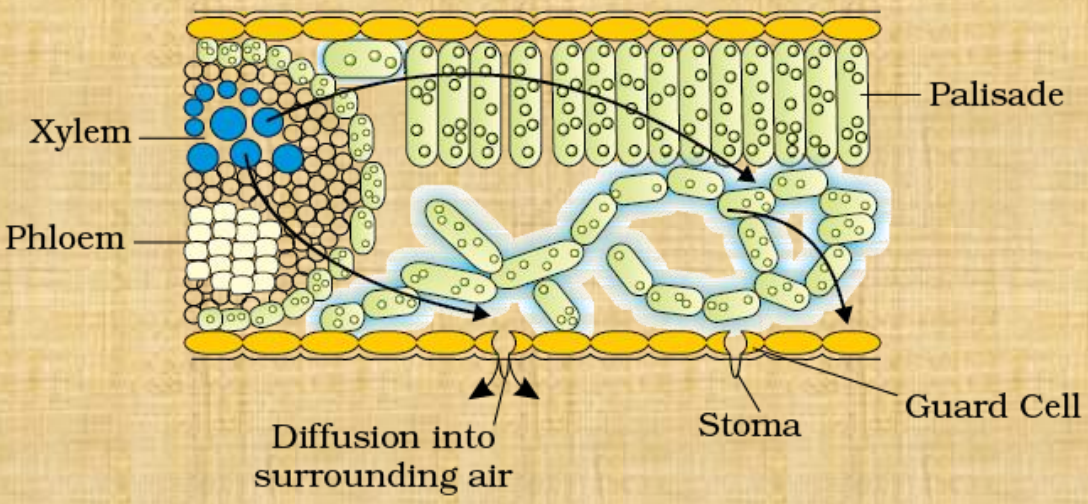


Fig. Water movement in the leaf

Process of transpiration:

- Water is continuous column from roots to leaves.
- When stomata open evaporation of water from sub stomatal space occur because of water potential gradient between atmosphere and leaves.
- When water is evaporated from sub stomatal space the water from surroundings, enter into sub stomata like that water move from veins to leaf surrounding.
- Water move from stem to leaf veins.
- Also water moves from roots to stem.
- Water moves from soil to root because of pressure gradient created by transpiratory pull.

Transpiration helps for longer distances of water transport.