

EXPERIENTIAL LEARNING



MOTIVATION/PREVIOUS KNOWLEDGE TESTING

Q.1 Which parts of the plants make food?

Q.2 What is used in making food by the plants?

Q.3 How do water and minerals reach leaves of the plant?

Q. 4 How is food distributed to all the parts of the plant which do not prepare it?

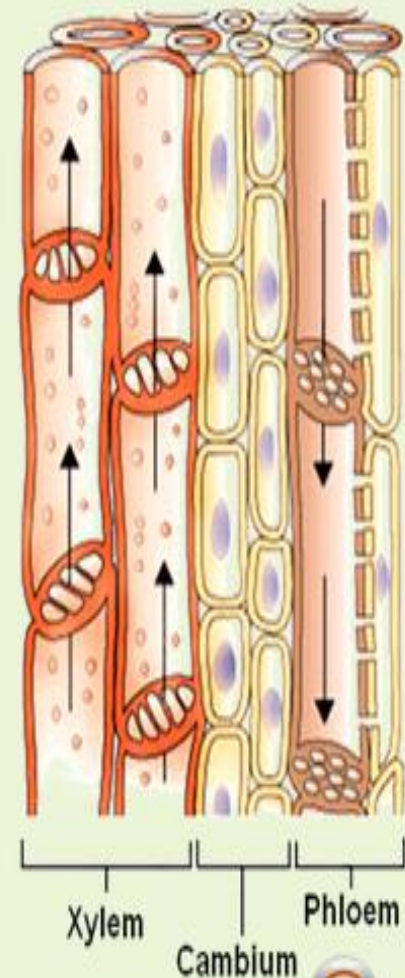
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INTRODUCTION

The transportation system in plants make use of vascular tissues for transporting water, minerals and food.

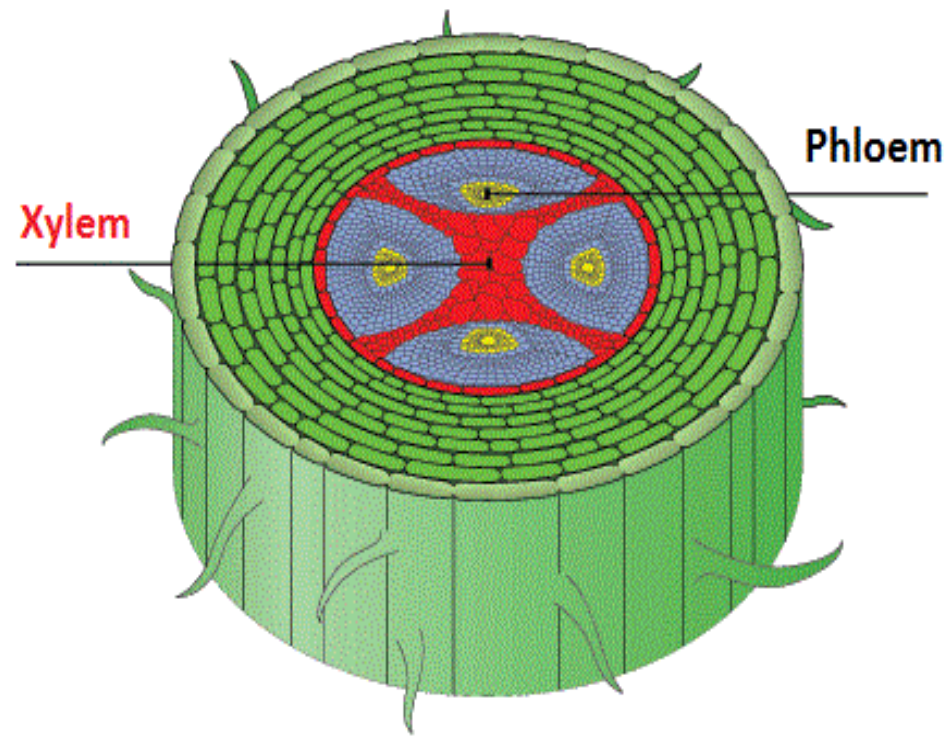
- Plant transport system moves energy rich biomolecules from leaves and raw materials from roots.
- Both the pathways are present as organised independent conducting tubes.



VASCULAR TISSUES

Two types of vascular tissues are used by the plants for transportation:

1. **Xylem:** Transport water and minerals
2. **Phloem:** Transport food

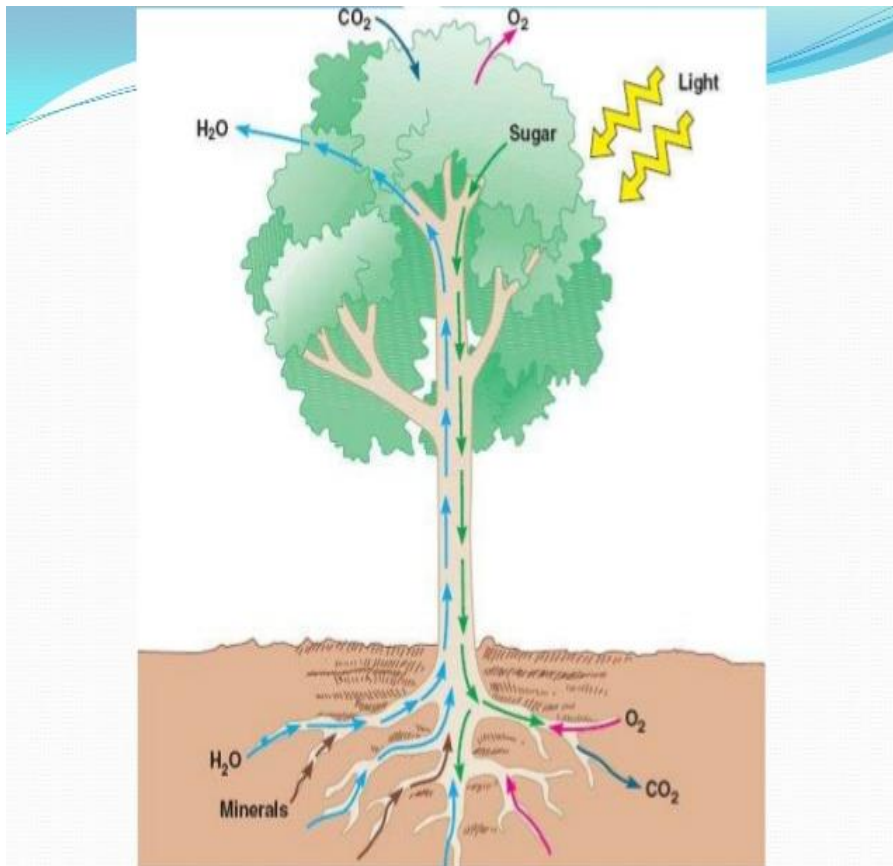


TRANSPORT OF WATER & MINERALS



- Water and minerals are absorbed by the roots.
- Xylem helps in the upward movement of water and minerals.
- Two forces help in this upward transport:
 1. Transpirational pull
 2. Root Pressure

TRANS PORT OF WATER & MINERALS



- The upward movement of water and minerals from roots to the site of photosynthesis is called ascent of sap.
- The ascent of sap takes place only in one direction i.e. upward direction.
- There is no expenditure of energy for ascent of sap

TRANSPORT OF WATER & MINERALS

ACTIVITY

- ☐ Prepare a hydroponics of one small plant in a conical flask.
- ☐ Take another conical flask of same size and pour water in it.
- ☐ Cover the mouths of both the conical flasks with plastic sheet so that moisture should not escape by evaporation.
- ☐ Place both the flasks in sun for an hour.
- ☐ Note the level of liquids in both the set ups

TRANSPORT OF WATER & MINERALS

OBSERVATIONS

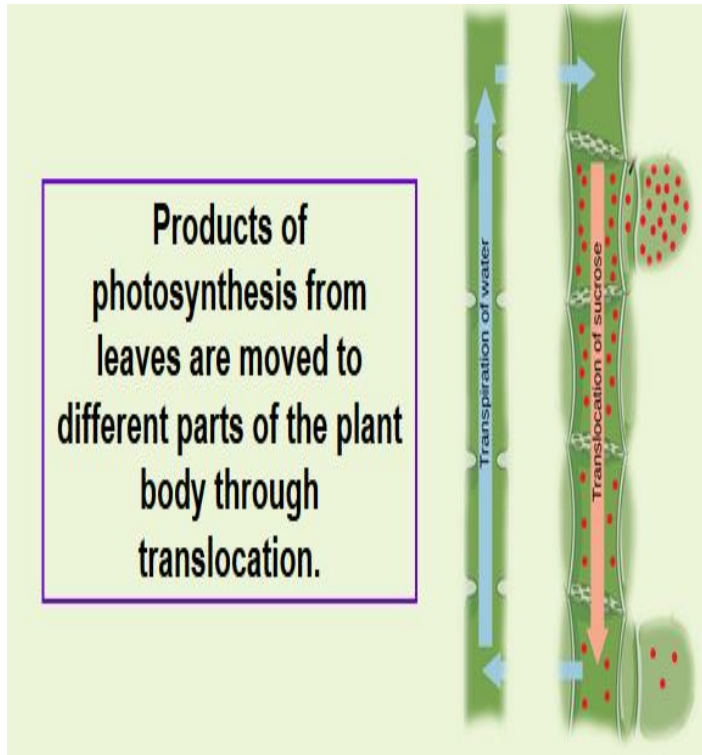
The level of liquid decreases in the hydroponics while remain same in the other conical flask without plant.

CONCLUSION

The water and minerals are absorbed by the roots in hydroponics while there is no such absorption in the other conical flask.

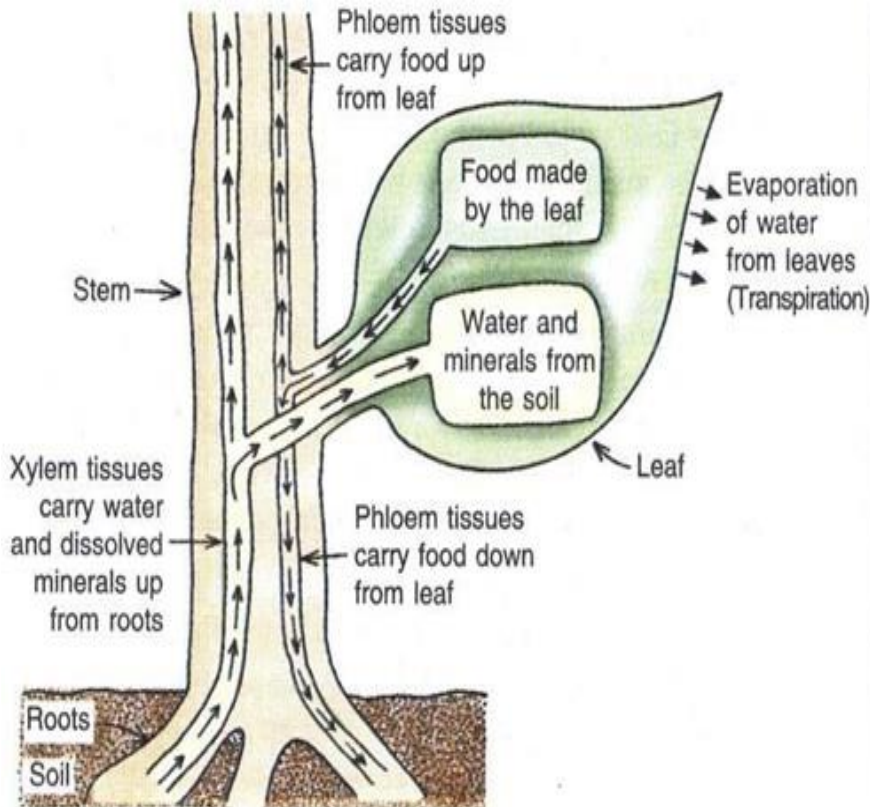
☐ This shows that water and minerals are absorbed by roots.

TRANSPORT OF FOOD



- The food is transported by phloem in plants.
- Besides the products of photosynthesis, phloem also transports amino acids and other substances.
- The transport of food from leaves to other parts of the plant is called translocation.

TRANSPORT OF FOOD

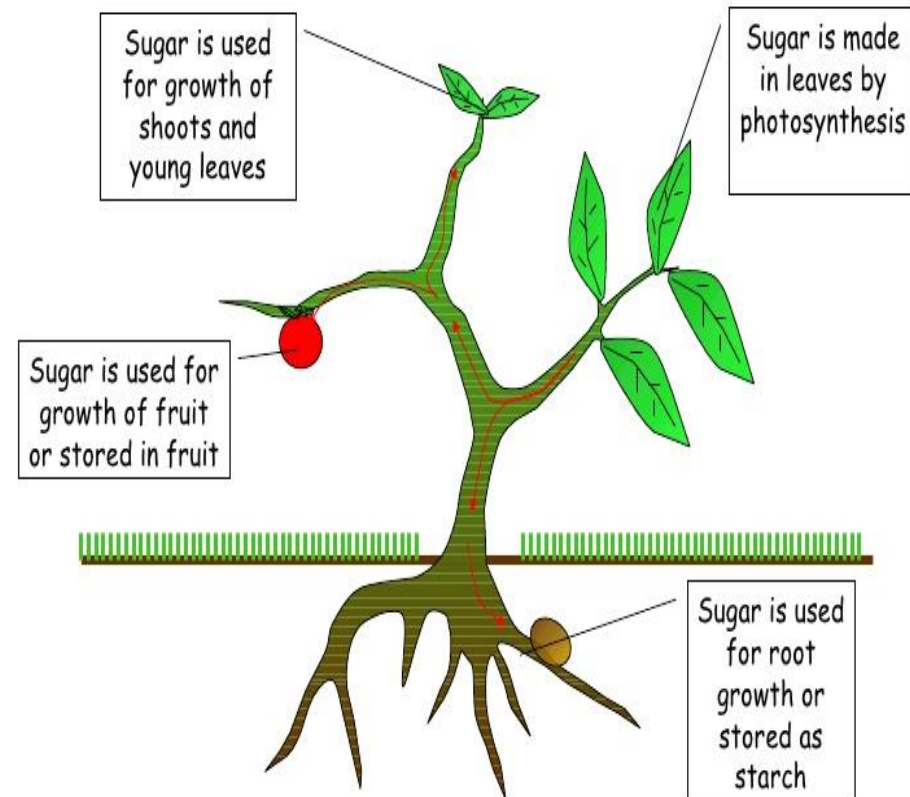


- The translocation of food and other substances takes place in the **sieve tubes** with the help of **companion cells**.
- The transport of food takes place in both, **upward and downward** directions.

TRANSPORT OF FOOD

- The translocation in phloem is achieved by **utilizing energy from ATP**.
- When materials like sucrose move into the phloem, there is increase in the osmotic pressure of the tissue.
- This leads the movement of water in the phloem, causing the movement of materials to other parts.

Food Transport in Plants



TRANSPORT OF FOOD

ACTIVITY

- ☐ Take students out to perform a small activity on a tree.
- ☐ On a trunk of tree, a ring of bark is removed carefully up to the depth of phloem layer.
- ☐ Leave it for a week and observe after one week.

TRANSPORT OF FOOD

OBSERVATIONS

The portion of the bark above the ring on the stem becomes swollen.

CONCLUSION

In the absence of phloem, there is no transport of food in downward direction due to which food accumulates on the ring and becomes swollen.

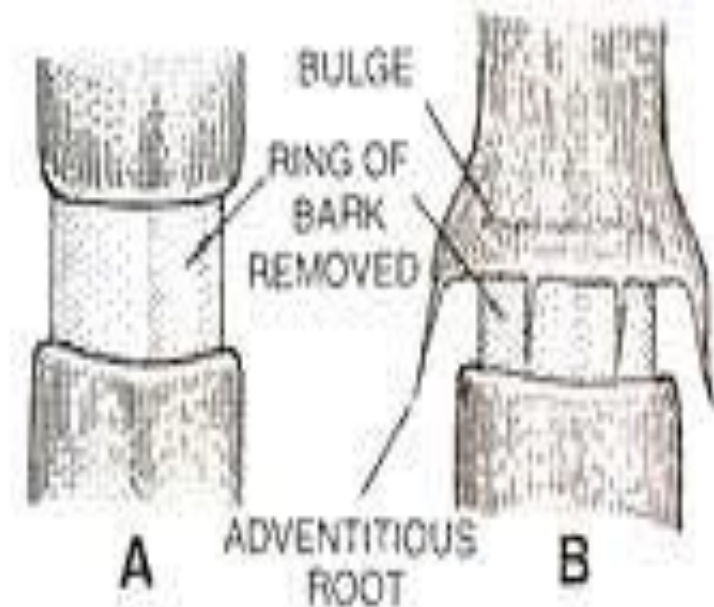


Fig. 11.40. Girdling of tree trunk to show that organic nutrients accumulate in the bark above the girdle where a bulge is also produced.

thank
you