

➤ Transport in Plants

Vascular tissues and transport of nutrients

Vascular Plants have vascular tissues i.e. xylem and phloem.

1. **Xylem:** Xylem is the vascular tissues, specialized for condition of water and minerals to fulfill the deficiency of water lost by transpiration.

Xylem is compound/complex tissue consist of following FIVE different types of cells/tissues:

- i. Xylem parenchyma
- ii. Xylem fibres
- iii. Wood
- iv. Tracheids
- v. Vessels

Koracademy.com

Tracheids

- These are elongated cells with tapering ends.
- Tracheids are attached side by side.
- The cell wall is lignified.
- 80µm in diameter.
- They are living when immature, at maturation loss protoplast and become dead.
- They are surrounded by storage cells and supporting cells.
- Water condition occurs through pits (pores).
- Tracheids are the characteristic feature of gymnosperms.

Vessel elements

- Vessel elements are shorter and wider i.e. less tapered.
- Vessel elements are attached end to end.
- Water condition occurs through perforated end walls.
- Vessel elements are the characteristic feature of angiosperms.

Phloem: Phloem is specialized for the conduction of organic nutrients.

- Phloem is complex tissues.
- Phloem forms the inner bark.
- Phloem is consist of the following FIVE different type of cells/tissues:
 - i. Phloem parenchyma
 - ii. Phloem fiber
 - iii. Phloem ray cells
 - iv. Sieve tubes
 - v. Companion cells

Koracademy.com

Sieve tubes

- These are shorter and broader cells, attached end to end.
- These are living cells.
- The end of walls is perforated and the pores are called sieve.
- The perforated end of walls appears are plate called sieve plate.

Function: The sieve plates are the open channels which allow the translocation of organic nutrient.

Companion cells: They are living cells with elongated nucleus and thin walled associated with almost each sieve tube.

Function: Companion calls provide energy to sieve tubes and help in translocation of organic nutrients. Companion cell and sieve tube are in communication with each other through plasmodesmata. Organic nutrients from mesophyll cells of leaf move to sieve tubes through plasmodesmata. Companion cells are present in angiosperms but absent in gymnosperm and ferns.

