UNIT – 18

ORGANIZATION OF TISSUES

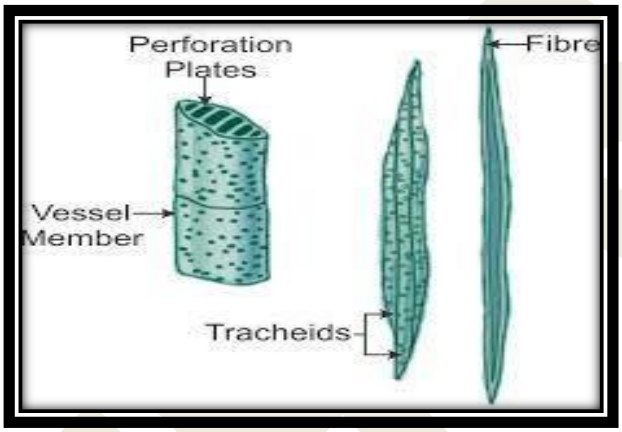
COMPLEX TISSUES

- ✓ Complex tissues are made of more than one type of cells that work together as a unit.
- ✓ Complex tissues consist of parenchyma and sclerenchyma cells.
- ✓ C**ollenchymatous** cells are not present in complex tissues.

Common examples are **xylem and phloem.**

XYLEM

Xylem is a conducting tissue which conducts water, mineral nutrients upward from root to leaves.



Xylem gives mechanical support to the plant body. Xylem is composed of:

- Xylem tracheids
- Xylem fibres
- Xylem vessels
- Xylem parenchyma.

XYLEM TRACHEIDS:

- These are elongated or tube-like dead cells with hard, thick and lignified walls.
- Their ends are tapering, blunt or chisel-like and devoid of protoplast.
- They have large lumen without any content. Their function is conduction of water and providing **mechanical support** to the plant.

XYLEM FIBRES:

- These cells are elongated, lignified and pointed at both the ends.
- Xylem fibres **provide mechanical support** to the plant.

XYLEM VESSELS:

- These are long cylindrical, tube like structures with lignified walls and wide central lumen.
- These cells are dead as these do not have **protoplast.**
- They are arranged in longitudinal series in which the partitioned walls (transverse walls) are perforated, and so the entire structure looks-like a waterpipe.
- Their main function is to and also to provide **mechanical strength.**

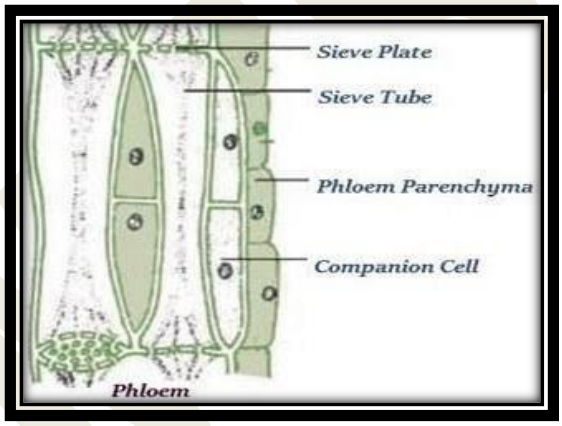
XYLEM PARENCHYMA:

- These are living and thin walled cells.
- The main function of xylem parenchyma is to **store starch** and **fatty substances**.

PHLOEM

Phloem is a complex tissue and consists of the

- ❖ Sieve element
- ❖ Companion cells
- ❖ Phloem fibre
- ❖ Phloem parenchyma.



SIEVE ELEMENTS:

- The conducting elements of phloem are collectively called as Sieveelements.
- Sieve tubes are elongated, **tube-like slender cells** placed end to end.
- The transverse walls at the ends are **perforated** and are known as sieve plates.The main function of sieve tubes is translocation of food, from leaves to the storage organs of the plants.

COMPANION CELLS:

- These are elongated cells attached to the lateral wall of the sievetubes.
- A companion cell may be equal in length to the accompanying sieve tube element or the mother cell may be divided transversely forming a series of companioncells.

PHLOEM PARENCHYMA:

- The phloem parenchyma are **living cells** which have cytoplasmandnucleus.
- Their function is **to store food materials.**

PHLOEM FIBERS:

- Sclerenchymatous cells associated with primary and secondary phloem are commonly called phloem fibers.
- These cells are elongated, lignified and **provide mechanical strength** to the plant body.