# PHLOEM

- Transports food materials usually from leaves to other part of plant.
- It is composed of four elements:-
  - Sieve tube elements.
  - Companion cells.
  - Phloem parenchyma.
  - Phloem fibres.

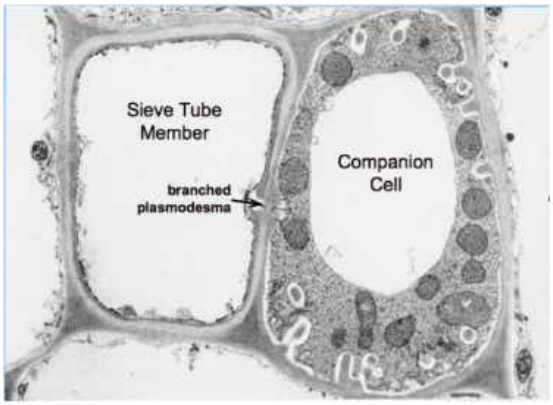
## SIEVE TUBE ELEMENTS

- Long tube like structure arranged longitudinally
- Associated with companion cells.
- End walls are perforated (Pierced to make holes) to form sieve plates.
- A mature sieve element possesses peripheral cytoplasm and a large vacuole but lacks nucleus.
- The function of sieve elements controlled by nucleus of companion cells.
- Sieve tubes are absent in pteridophytes and gymnosperms. Sieve cells and albuminous cells are the conducting elements in gymnosperms.



## COMPANION CELLS

- Specialized parenchymatous cells.
- Closely associated with sieve tube elements.
- Connected with sieve tube element by pit fields longitudinally.
- Helps in maintaining pressure gradient in the sieve tubes.




## PHLOEM PARENCHYMA

- Made up of elongated tapering cylindrical cells
- Have dense cytoplasm and nucleus.
- Cell wall made of cellulose and has pits through plasmodesmatal connections exist between the cells.
- Store food materials and other substances like resins, latex and mucilages.
- It is absent in monocotyledons.