Permanent Tissues

Characteristics

- Differentiated cells with loss of division capability.
- Cell wall comparatively thicker than meristematic tissues
- Typically contains large vacuoles(maintains turgor pressure inside cell)
- Nucleus small and peripheral (allows space for vacuole and other cell Organelles)
- Cytoplasm dense
- Various shapes like oval, round, elongated or rectangular.
- Presence of Intercellular spaces
- Have functional specificity.

Can permanent tissues never divide?

Permanent tissues can regain their ability to divide and revert to a meristematic state through a process called dedifferentiation, a process that allows cells in permanent tissues to re-enter the cell cycle and develop into new meristematic tissue, such as secondary meristems.

Simple Permanent Tissues

Composed of a single type of cell and are responsible for basic functions like support, storage, and photosynthesis

Parenchyma:

- Living cells at maturity
- Relatively thin cell wall compared to other permanent tissues
- Lots of Intercellular spaces are there to help in gaseous exchange
- Can be spherical, oval, elongated, or polygonal with a large central vacuole.

Location:

Leaves, Stems and roots, Fruits, Other soft tissues like flowers, petioles etc.

Function:

Storage, Gaseous exchange, Support, Wound healing, Secretion

Simple Parenchyma

- Cells are round, oval in shape.
- Intercellular spaces are small.
- Thin cell wall made up of cellulose, hemicellulose
- Water is aboundant in large centrally placed vacuoles.

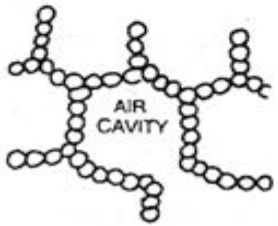
Chlorenchyma

- Cells which have chloroplast and perform photosynthesis
- The mesophyll cells in leaves which differentiate into palisade and spongy cells
- In the other green parts of the plants like stems, sepal etc.

Two types of Chlorenchymatous cells in mesophyll

Aerenchyma

- They contain very large intercellular spaces and large vacuoles.
- Helps in the buoyancy of the floating plants.
- Cells are continuous from shoots to roots and help in diffusion of air from leavesAerenchyma cells are continuous from shoots to roots and help in diffusion of air from leaves to roots.
- Helps in maintaining sufficient oxygen levels for respiration. to roots.



Aerenchyma

Prosenchyma

- These are fibre-like elongated cells, which are thick-walled and provide rigidity and strength to the plant.

Idioblasts

- Specialized parenchyma cells in plants that differ from their surrounding cells in structure or content.
- They often store various substances like tannins, resins, oils, or crystals (e.g., calcium oxalate).
- Has unique role, often related to storage or secretion.