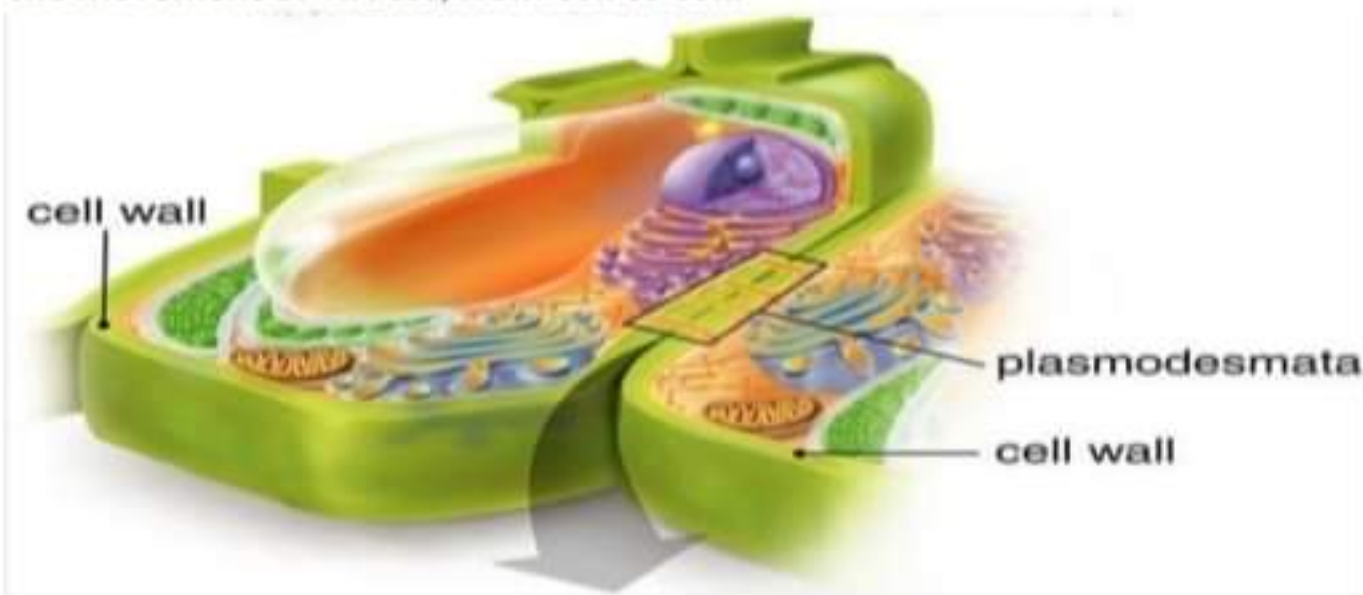


Plasmodesmata:

Cytoplasmic strand like structure extending from protoplasts into the cell wall and interconnecting the living protoplasts of the plant body are called Plasmodesmata. These are found in red algae, mosses, gymnosperms and angiosperms. They may be found throughout all living tissues. The plasmodesmata occur either in groups or are distributed throughout a wall. The plasmodesmata are considered to be concerned with transportation of materials and conduction of stimuli. They are also regarded as channels for the movement of viruses, from cell to cell.



Plasmodesmata in Plant Cell

Pits:

Secondary walls are commonly characterized by presence of depressions or cavities called Pits. Such depressions are also present on the primary walls and these differ from the pits present in the secondary walls in structure and development. These depressions are known as **Primary Pit Fields**. In primary pit-fields, the primary wall is thin and continuous across the primary pit-field area. While in pits, the secondary wall is not deposited in the pit region.

The substances pass through the pits from cell to cell. Generally, each pit has a complementary pit exactly opposite it, in the wall of the neighbouring cell. Such pits form a morphological and functional pair called the **Pit Pair**. The cavity formed by the break in the secondary wall is called **Pit Cavity**. The membrane consisting of primary cell walls and middle lamella, separating the

pit-cavities of the pit-pair, is called **Pit Membrane or Pit Closing Membrane**. The opening of the pit on the inner side of the cell wall, i.e., towards the cell lumen, is called Pit Aperture.

The pits are of two types:

Simple Pits: The secondary walls are deposited in such a way that it does not overarch the pit cavity. Such pits are termed as simple pits.

Bordered Pits: The secondary wall develops over the pit cavity to form an overarching hood with a narrow pore in the centre.

Simple Pit-Pair: If the two pit-pairs are simple, they are known as Simple Pit-Pair.

Bordered Pit-Pair: If the two pit-pairs are bordered, they are known as Bordered Pit-Pair.

Half Bordered Pit-Pair: If one of the pits is simple and the other is bordered, it is known as Half Bordered Pit-Pair.

Blind Pit: If the pit is without its opposite partner or opposite it an intercellular space is present, it is called Blind Pit.

Unilateral Compound Pit: Sometimes, two or more pits are found opposite one large pit. Such an arrangement is called Unilateral Compound Pitting.

The pit cavity of a simple pit may have uniform diameter throughout its length, or it may widen or narrow toward the pit aperture. Simple pits are usually found in parenchyma cells, fibres and in Sclereids.

Torus:

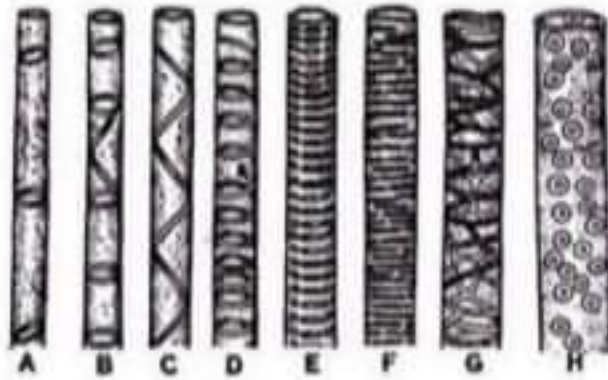
In some plants, pit membrane of a bordered pit-pair is thickened in the centre in the form of a disc. This thickening is called Torus.

Types of Pitting:

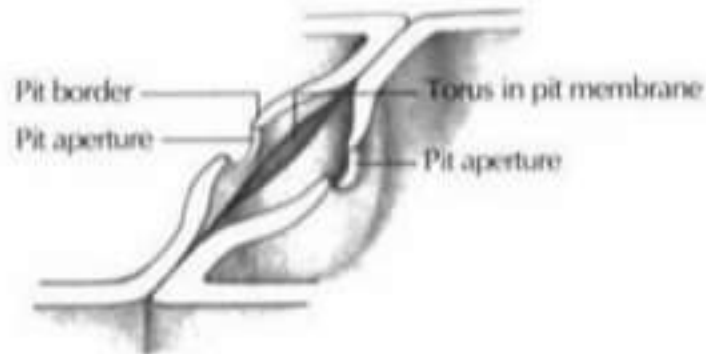
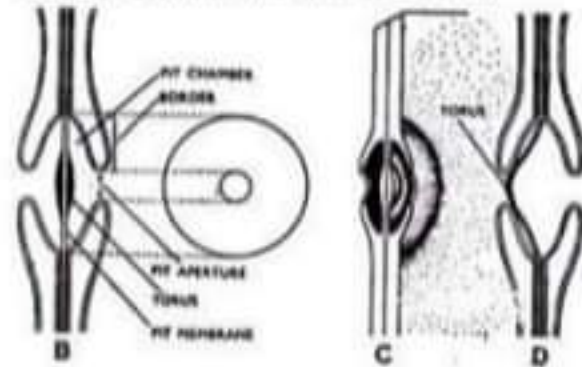
Bordered pits are found in tracheary elements and fibre-tracheids. The bordered pits present in the tracheary elements show various types of arrangements and they also vary in shape. The pits may be elongated or linear and are arranged in ladder-like tiers. Such arrangement is called **Scalariform Pitting**. When the pits are circular or slightly elongate and are arranged in horizontal lines on the walls. Such an arrangement is known as **Opposite Pitting**. Sometimes the pits may be circular or slightly and are arranged in

diagonal lines on the walls. This type of arrangement is known as **Alternate Pitting**.

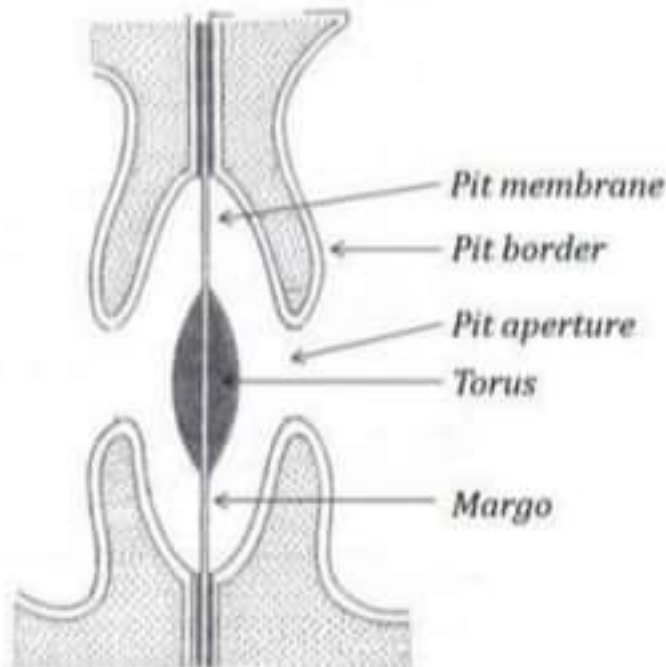
A & B. Annular, C & D. Spiral, E & F. Scalariform, G. Reticulate, H. Pitted



Bordered Pit-Pair in Section & face View



Thickening of Cell Wall & Different Types of Pits



Ultra-structure of Bordered Pit

Opening and Closing of Pit

