

Difference Between Fibres and Sclereids

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Key Difference - Fibres vs Sclereids

Plant cells are divided into three main types namely, parenchyma, collenchyma, and sclerenchyma. They have their unique structural and functional properties which aid in the plant growth and development. The main function of sclerenchyma cells is to provide mechanical strength to the plant and the mature cells contain lignin deposits which are characteristic of sclerenchyma. There are two main types of sclerenchyma cells such as Fibres and Sclereids. Sclerenchyma fibres are elongated cells which have long tapered ends and are present in most parts of the plant. They are originated from the meristematic cells. Sclerenchyma Sclereids are cells which have a varying shape are distributed in the cortex, pith, xylem, and phloem. They originate from the thickening of parenchymal cells. The **key difference** between fibres and sclereids is the shape of the cells. **Fibres are long and elongated with tapering ends whereas Sclereids are of varied shapes primarily round or oval in shape.**

What are Fibres?

Sclerenchyma fibres are the cells which are elongated and having characteristic tapering ends which are distributed throughout the plant. These fibres are arranged as fibre bundles which participate in inducing mechanical strength to the plant. Fibres are rich in lignin whereas pectin and cellulose are absent. The cells have less affinity for water therefore, they are not hydrated. The fibre cells of sclerenchyma also consist of pits distributed along the elongated cell.

Fibres are distributed throughout the plant as they primarily function to provide mechanical strength to the plant. Depending on the place of distribution, the type of fibre may vary in structure. The types of fibres are mainly classified into two main classes as xylary and extra-xylary. Xylary fibres are the fibres which are associated with the xylem whereas extra-xylary fibres are associated with tissues other than the xylem. Xylary fibres are four main types namely, libriform fibres, fibre tracheids, septate fibres and mucilage fibres.

Libriform fibres contain long and simple pits whereas fibre tracheids consist of short but bordered pits. Septate fibres have septa or cross walls formed in the fibre cell. This leads to a partitioning of the fibre cell. Septate fibres are found in cells which are mitotically dividing. Mucilage fibres are the fibres which are composed of a gelatinous layer. The mucilage fibres cannot be clearly distinguished as xylary or extra-xylary. Extra-xylary fibres are classified as phloem fibres, pericyclic/perivascular fibres and cortical fibres.

Phloem fibres are associated with the phloem. The phloem fibres associated with the primary phloem is referred to as 'Bast fibre' whereas the fibres associated with the secondary phloem is referred to as 'Flax fibre'. Phloem fibres are soft and are often non – lignified thus, hemp is a good example of phloem fibres. Pericyclic or perivascular fibres are distributed in the stems of dicots and they are found in close proximity to the vascular bundles of the plant. Lignification is prominent in these cell types.

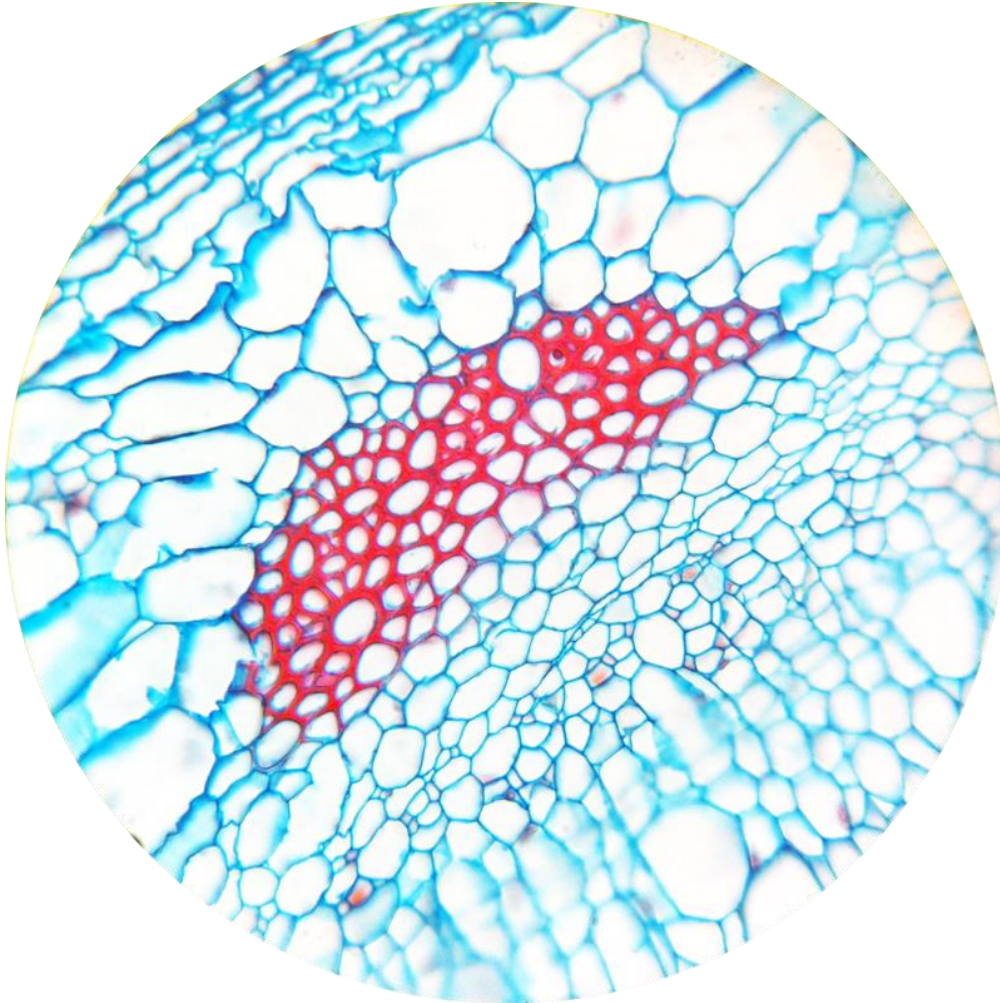


Figure 01: Sclerenchyma Fibres

Cortical fibres are extraxylary fibres found in the stem and originate in cortex e.g. Barley. Cortical fibre gives mechanical strengths to the plant body.

What are Sclereids?

Sclereids are a type of sclerenchyma cells which are of varied shape, predominantly in oval or round shape. Sclereids are short cells which are composed of lignified secondary cell walls and simple pits. They are derived from mature parenchymal cells and have a high degree of lignification. They also provide mechanical strength to plants and composed of multi-layers of cells. There are 5 main classes of sclereid cells depending on the size and the shape of the cell; Brachysclereids or stone cells, Macrosclereids, Osteosclereids, Astrosclereids, and Trichosclereids.

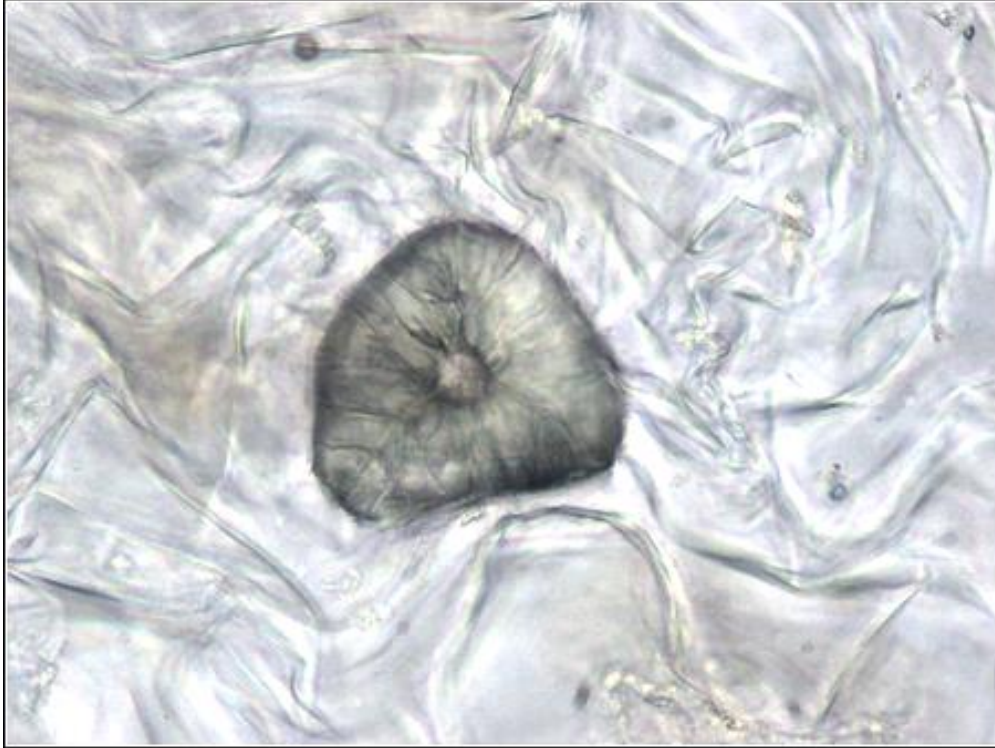


Figure 02: Sclereids

Brachysclereids which are also termed as stone cells are isodiametric or elongated in shape. They are distributed in the cortex, phloem, and pith. They are commonly found in the flesh of fruits such as Guava and endocarp region of apple. Macroscleroids are rod-shaped and are involved in the formation of the palisade in seed coats of [legumes](#). Osteoscleroids are columnar in shape. They are distributed in the sub-epidermal layer of the seed coats. Astroscleroids are star-like scleroid cells which have extensions in their cell structure. They are predominantly found on the leaf surfaces. Trichoscleroids are scleroid cells which have thin walls and branches. They are also found on leaf surfaces.

What are the Similarities Between Fibres and Sclereids?

- Both cell types are sclerenchyma cells.
- Both cells are lignified.
- Both cells provide mechanical support to the plant.
- Both cells are found in the xylem and phloem [tissues](#).

What is the Difference Between Fibres and Sclereids?

Fibres vs Sclereids	
Sclerenchyma fibres are elongated cells which have long tapered ends and are present in most	Sclerenchyma Sclereids are cells which have a varying shape and are distributed in the cortex,

parts of the plant.	pith, xylem, and phloem of the plants.
Cell Origin	
Origin of the fibres is meristematic.	Sclereids origin from mature parenchymal cells.
Shape	
Fibres are elongated.	Sclereids are broad and in varied shapes.
Cell Endings	
Fibres have tapering ends.	Sclereids have blunt ends.

Summary - Fibres vs Sclereids

Sclerenchyma cells are one of the three types of primary cells found in plants. They are lignified and classified as fibres and Sclereids. Fibres are elongated long cells which have tapering ends. Sclereids are of varying shape and are cells which have blunt ends. Both cell types are involved in providing mechanical strength to the plant. They are distributed throughout the plant.

Reference:

1. "Plant Anatomy." Plant Anatomy: Plant Tissues (Sclerenchyma). [Available here](#)
2. "Sclereids Cells in Plants | Simple Tissue." Biology Discussion, 12 Dec. 2016. [Available here](#)

Image Courtesy:

1. 'Botana curus X dicot fibers 400x' By Kelvinsong - Own work, (CC BY 3.0) via [Commons Wikimedia](#)
2. 'Plant cell type sclerenchyma sclereid' By Snowman frosty at en.wikipedia - Own work, (Public Domain) via [Commons Wikimedia](#)

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