

Tissues

Class-9

Notes

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Tissues

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Tissues are a group of cells that combine together to perform a particular function.

Plant tissues

Plant tissues are of various types and are made up of similar types of cells. They are different from animal tissues since there are several differences between animal and plant cells.

Animal tissues

Animal tissues are made up of animal cells. These tissues are usually not rigid since the cells do not have cell walls.

Plant Tissues

Meristematic tissues

Meristematic tissues are seen in plants. They are primarily made up of rapidly dividing cells. They are the growing tissues of the plant.

Permanent tissues

Permanent tissues arise from the meristematic tissue and have structural and functional properties. Permanent tissue can be made up of either living or dead cells.

Differentiation

Differentiation is the process by which the meristematic tissues develop into different types of permanent tissues based on the location and requirement of the plant.

Apical meristem

Apical meristem is present on the apex of the plant shoot and root. They are rapidly growing tissues and aid in increasing the height of the plant.

Lateral meristem

Lateral meristem are present on the lateral walls of the stem. They help in the horizontal growth of the plant and increasing the stem girth.

Intercalary meristem

Intercalary meristem can be found between the nodes of the stem and the base of the leaf. They help in branching.

Simple permanent tissues

These are tissues that are made up of only one type of cells. They usually have a structural role.

Complex permanent tissues

Complex permanent tissues are made by a combination of different types of cells. These cells work together to perform a specific task.

Parenchyma

Parenchyma tissues are made up of loosely packed cells with thin cell walls and large intercellular spaces. They are live cells and help in support and storage. Two types; Chlorenchyma and Arenchyma.

Collenchyma

Collenchyma tissues are made up of live cells which have irregularly thickened corners and thus, have decreased intercellular spaces. They help in bending various parts of the plant without breaking.

Sclerenchyma

Sclerenchyma tissues make up the hard and stiff parts of the plant. They are made up of dead, long, and narrow cells. They almost have no intercellular space as the walls are thickened due to the presence of lignin.

Phloem

Phloem is made up of the following components – sieve tubes, companion cells, phloem parenchyma, and phloem fibers. Phloem conducts food in both directions. Among all the components, phloem fibers are the only dead cells.

Xylem

Xylem is made up of the following components. The vessels and tracheids – help in the conduction of water and minerals from the soil. Xylem parenchyma helps in food storage and the xylem fibres provide mechanical support.

Animal Tissues

Epithelial Tissues

Epithelial tissues are seen on the outer layer of a body or organ surface. They form the outermost protective layer of most of the animals.

Squamous Epithelium

Squamous epithelium forms an extremely thin and flat layer of tissues. They are semi-permeable and thus, perfect for gaseous exchange. They are present in the lining of oesophagus and mouth.

Cuboidal Epithelium

As the name suggests, they are cuboidal in shape and form the lining of salivary glands and kidney tubules. They provide mechanical support. They also form glandular epithelium when they form glands.

Columnar Epithelium

These tissues line the organs which help in absorption and secretion, such as the lining of the intestines. They are made up of elongated cells. When cilia are present on these cells, they form ciliated columnar epithelium like those present in the respiratory tract.

Stratified Squamous Epithelium

This kind of tissue is formed when multiple layers of squamous

epithelium are arranged in a pattern. Our skin is made up of this kind of tissue.

Muscular Tissue

These tissues make up our muscles which are responsible for almost all the movements that take place in the body.

Striated/Skeletal Muscles

All the voluntary movements in our body is carried out by the striated or skeletal muscles. They are called skeletal because these tissues are mostly attached to the bones. They are long, cylindrical, unbranched with striations, and are multinucleated.

Unstriated/Smooth Muscles

Almost all the involuntary movements in the body are carried out by the smooth or striated muscles. They are long, smooth, spindle-shaped and uninucleate. We can find them in places like the alimentary canal and blood vessels.

Cardiac Muscles

Cardiac muscles make up our entire heart. These muscles are involuntary in nature and show rhythmic contractions and relaxations. Structurally they may look quite similar to striated muscles but they are branched, uninucleate and have intercalated discs.

Connective Tissues

These tissues help in connecting different parts of the body. Examples include blood, bones, cartilages, tendons, ligaments, areolar tissues, and adipose tissues.

Nervous Tissue

Nervous tissue makes up the entire brain, spinal cord, and nerves of the body. They are responsible for all sensations, consciousness, memory, and emotion.

Neurons

These are the cells that form the entire nervous system. The cell consists of a cell body, axon, and axon terminals.

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