CHAPTER- 3 Tissues: Plant & animal tissues.

Good morning students
This lesson is of class 8 for the subject of Biology Topic Plant tissues which is covered in Chapter 3 titled Tissues: Plant & animal tissues. starting on Pg No 23 of your text book titled: Concise Biology: Selina Publications and is being submitted to you on **02.12.2024**. This voice is of Nidhi Rana. Children please open page no 23 of your text book and let us start with discussion of various plant tissues.

Before discussing types of plant tissues first understand - what a tissue is?

Tissue is a group of similar cells performing a specific function For eg. muscular tissue in our body help to bring about movement in the body.

If we go up in the hierarchy we have organ, organ system and organism Let us see the relationship between tissue, organ organsystem and organism.

Organ Several tissues together contributing to some specific function inside the body constitute an organ For eg Heart, Brain.

Organ system Many organs working together to perform a specific life process constitute an organ system. For eg:- mouth, oesophagus

stomach, intestine etc together constitute the digestive system.

Organism - Many organ systems together functioning in coordinated manner to enable the independent existence, constitute an organism For eg Cat. Root and shoot system of plant together forms a plant. Now let us discuss various types of

Plant Tissues Plant tissues are of 2 types

i Meristematic Tissues - made up of actively dividing cells and the cells are undifferentiated i.e. the cells are alike and are not performing any specific function.

ii Permanent Tissues are made up of non dividing cells which are specialised to perform a specific function (i.e. differentiated cells).

Now let us discuss these two types of plant tissues one by one -

1 Meristematic Tissues General characteristics of meristematic tissues are as follows -

i Meristematic tissues are made up of actively dividing cells, thus are responsible for growth in plants.

ii These are found at tips of roots, stems and branches i.e. at all growing points of plants.

iii These are present between the bark and wood of trees where it leads to growth in diameter of the stem

iv Cells of meristematic tissues are small, usually cubical with thin cell wall

v Cells of meristematic tissues have large nucleus, dense cytoplasm and vacuoles are generally absent

vi Meristematic tissues have compactly arranged cells with no intercellular spaces.

vii Meristematic tissues have cells that possess the power of cell division, they divide repeatedly and produce new cells. These cells later on after differentiation give rise to permanent tissues.

Types of Meristematic Tissues

Meristematic tissues are of two types -

i Apical or Terminal meristematic tissues - are located near the tips of roots and stems and also in growing young leaves, near the tips of stems as well as on the tips of axillary buds

ii Lateral meristems or Cambium. - These are situated below the bark and are responsible for increase in the girth of the stem.

Students please look at Fig 3.1A on Page No 23 of your text book showing location of meristematic tissues

Before going further let us recapitulate the topic we have done till now by means of a short test Listen to the following questions and then pause the audio for 3 min to write their answers in your notebooks.

Questions are as follows -

Q1 Name the two types of meristematic tissues

Q2 Name the type of plant tissues that have undifferentiated and actively dividing cells.

You may pause the audio for 3 mins now. Break is over Children, first listen to the correct answers.

A1 2 Types of meristematic tissues are -
(i) Apical meristems (ii) Cambium.

A2 Meristematic Tissues have actively dividing cells.

Now let us resume the topic plant tissues with the discussion of 2nd type of plant tissues ie.

Permanent Tissues

Permanent Tissues arise from meristematic tissues The cells of permanent tissues have lost their ability to divide and have assumed final shape, size and function after the process of differentiation.

Based on 'Types of cells' permanent tissues are of following types -

i Simple permanent Tissues - These are composed of single type of cells For eg parenchyma, collenchyma and sclerenchyma

ii Complex permanent Tissues - Complex permanent Tissues are made up of different types of cells For eg. Xylem and Phloem.

We will discuss all these types of tissues in detail further in the chapter

Based on function Permanent tissues are of following types -

I. Protective Permanent Tissues - that provide protection to plant parts These tissues include epidermis and cork These have thick walls and are found on the surface of roots, stems and leaves [i.e. outermost layer of plant's body] For example -

a) Epidermis is forming outer most layer of plant's body and is covered with waterproof layer called cuticle

b) Cork - In old roots and stems, the epidermal tissues at the periphery is replaced by cork. Cork cells are dead and thickened by deposition of suberin which makes cork impermeable to water

II. Supporting Tissues These tissues form the bulk of plant parts i.e. are present maximumly in various regions of plant's body.

There are 3 types of supporting tissues

i Parenchyma are widely distributed in plant's body General characteristics of parenchyma are as follows -

1. Parenchyma cells are similar in structure and function.
2. Parenchyma cells are large thin walled cells These may be oval, circular or polygonal in shape.

3 They have usually a single large vacuole and dense cytoplasm

4. These are found in soft parts of plant such as cortex (outer part) and in pith (central part)

5 Function Parenchyma provide temporary support to the plant parts. They may store food as in potatoes

6. In leaves parenchyma cells may contain chloroplast and are called chlorenchyma which help in doing photosynthesis

ii Collenchyma being strong and flexible tissue is a strengthening (mechanical) tissue of the growing organs. These are made up of elongated cells. Cells of collenchyma are living with thick walls; where thickenings are present at the corners of the cells

Location Collenchyma are found in leaf stalks and below the epidermis of stems

function These tissues provide support to plant parts. These provide mechanical strength and flexibility to plants growing stems

iii Sclerenchyma are strengthening (mechanical) tissues. These are composed of long, narrow cells which have become dead. These possess hard, thick lignified walls. Lignin is waterproof material.

Function - Sclerenchyma provide strength to plant parts

Location Sclerenchyma are found in stems and veins of leaves. Jute and coir contains long, narrow pointed sclerenchyma cells. Hard grit in pear fruit contains short irregular sclerenchyma, also called stone cells.

Children let us conclude our discussion here Conducting Tissues we will discuss in the next class. Now I will give you some home assignment questions which you all have to do in your notebooks

Home assignment questions are as follows-

Q1 Please do the following Review questions given at the end of Chapter 3.

D Long Answer Type

Q No 1

Q No 2 part a, b and c

Q2 Draw various types of supporting plant tissues in your notebooks.