TOPIC: ANATOMY OF FLOWERING PLANTS: CLASSIFICATION OF TISSUES-I

LECTURE NO:19
CLASS:XI
DATE: 12TH MAY 2020
AUTHOR: DR.NIRMAL KUMARI

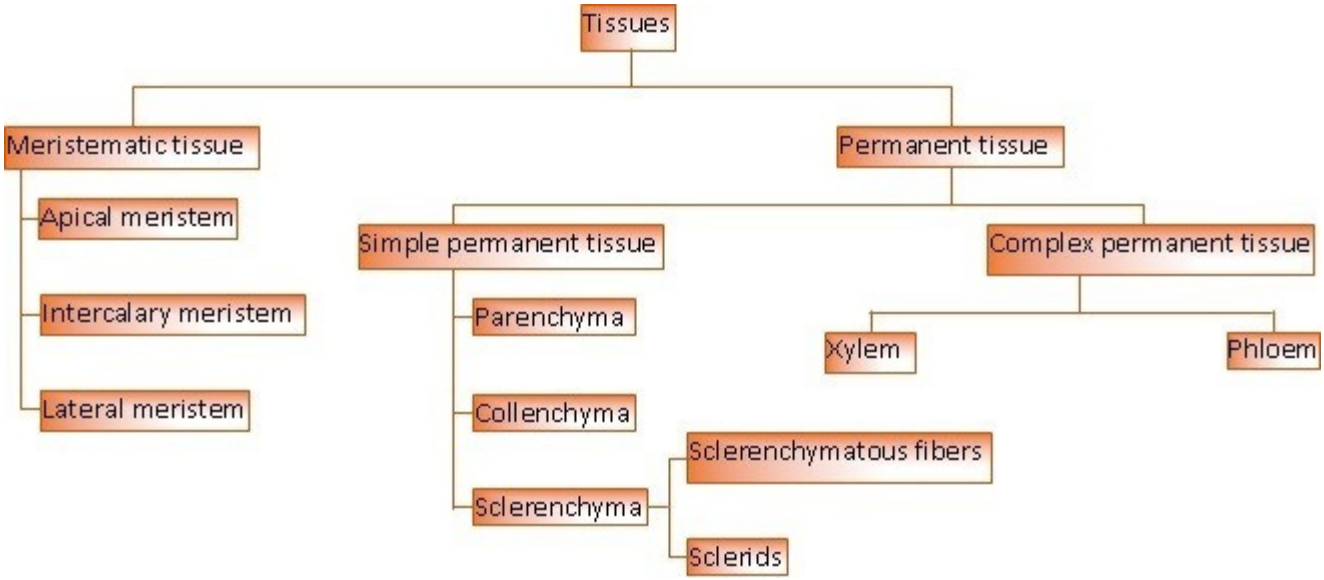
ANATOMY OF FLOWERING PLANTS

- Study of internal structure of plants is called **anatomy**.
- Plants have cells as the basic unit, cells are organised into tissues and in turn the tissues are organised into organs. Different organs in a plant show differences in their internal structure.
- Internal structures also show adaptations to diverse environments.

THETISSUES

A tissue is a group of cells having a common origin and usually performing a common function.

Classification of tissues –



Meristematic Tissues

- This tissue is responsible for active cell division which results in Growth in plants.
- Based on location and origin, Plants have different kinds of meristems.
- **Apical meristem –**

  The meristems which occur at the tips of roots and shoots and produce primary tissues.e.g., root and shoot apical meristem.

  During the formation of leaves and elongation of stem, some cells 'left behind' from shoot apical meristem, constitute the **axillary bud**. Such buds are present in the axils of leaves and are capable of forming a branch or a flower.

- **Intercalary meristem –**

The meristem which occurs between mature tissues is known as intercalary meristem.

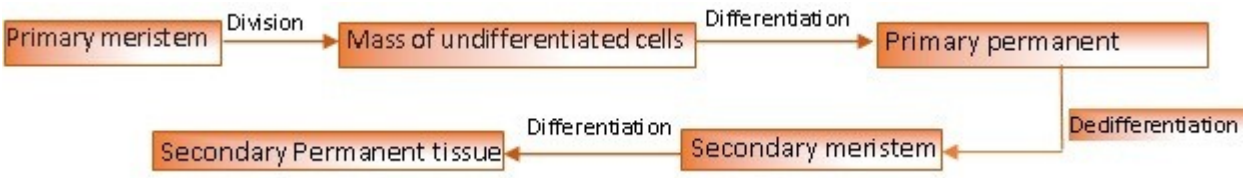
They occur in grasses and regenerate parts removed by the grazing herbivores.

Both apical meristems and intercalary meristems are **primary meristems** because they appear early in life of a plant and contribute to the formation of the primary plant body.

- **Lateral meristem –**

The meristem that occurs in the mature regions of roots and shoots of many plants, particularly those that produce woody axis and appear later than primary meristem is called the **secondary** or lateral meristem.

Fascicular vascular cambium, interfascicular cambium and cork-cambium are examples of lateral meristems. These are responsible for producing the secondary tissues.



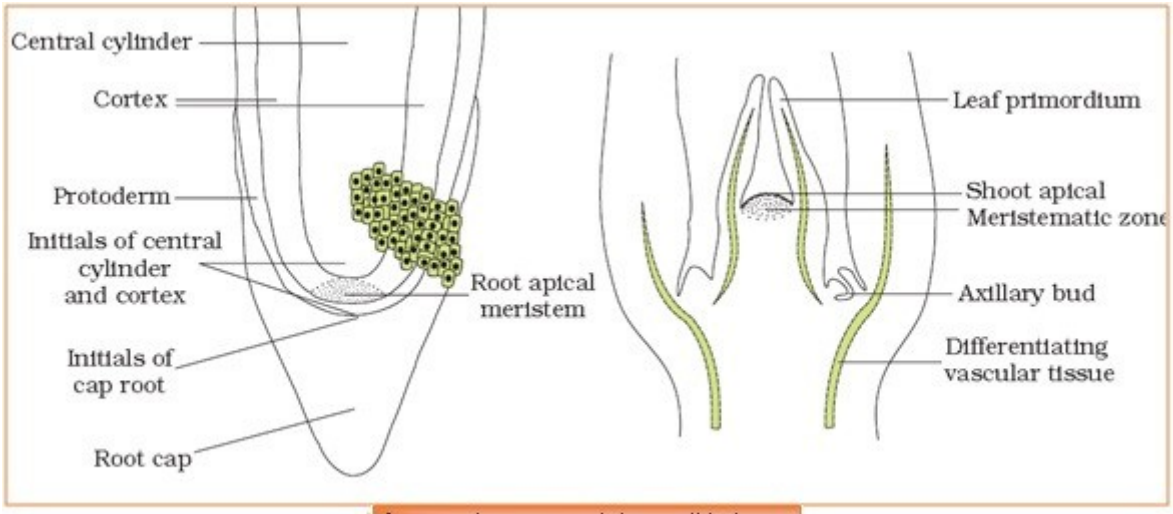


Fig: Apical meristem: (a) Root (b) Shoot

Permanent Tissues

- The cells of the permanent tissues do not generallydivide further.
- Permanent tissues having all cellssimilar in structure and function are called **simpletissues**. Permanent tissues having many differenttypes of cells are called **complex tissues**.

Simple Tissues

Parenchyma –

- It forms the majorcomponent within organs.
- The cells of theparenchyma are generally isodiametric.
- Their walls are thin and madeup of cellulose.
- They may either be closely packedor have small intercellular spaces.

- Theparenchyma performs various functions likephotosynthesis, storage, secretion.

Collenchyma –

- It is present in layers below theepidermis (hypodermis) in dicotyledonous plants.
- It is foundeither as a homogeneous layer or in patches.
- Itconsists of cells which are much **thickened at thecorners** due to a deposition of cellulose,hemicellulose and pectin.
- Collenchymatous cellsmay be oval, spherical or polygonal and oftencontain chloroplasts.
- Intercellularspaces are absent.
- They provide mechanicalsupport to the growing parts of the plant such asyoung stem and petiole of a leaf.

Sclerenchyma –

- It consists of long, narrow cellswith thick and lignified cell walls having a few ornumerous pits.
- They are usually dead and withoutprotoplasts.
- It provides mechanical support to organs.
- On the basis of variation in form,structure, origin and development, sclerenchymamay be either fibres or sclereids.
- **Fibers–** these arethick-walled, elongated and pointed cells,generally occuring in groups, in various parts ofthe plant.
- **Sclereids –** theseare spherical, oval orcylindrical, highly thickened dead cells with very narrow cavities (lumen). These are commonly found in the fruit walls of nuts; pulp of fruits like guava, pear and sapota; seed coats of legumes and leaves of tea.

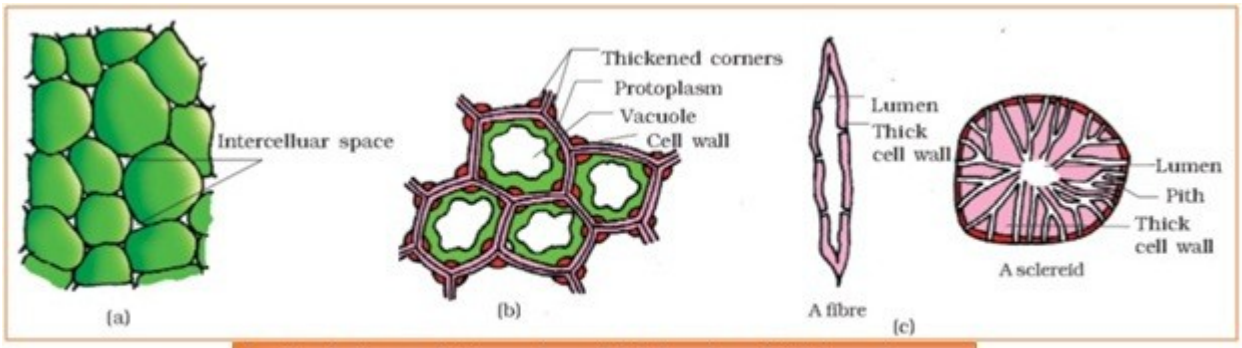


Fig: Simple tissues :(a) Parenchyma(b) Collenchyma(c) Sclerenchyma