Plant Histology

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(4)

A. Apical Meristems –Shoot Apex:

FOR GYMNOSPERMS

Popham (1952) distinguished three main types of gymnosperm shoot apex, based on the structure and development:

1. Cycas Type:

There are three meristematic zones:

(a) The Surface Meristem

(b) The Rib Meristem

(c) The Peripheral Meristem

2. Ginkgo Type:

There are five meristematic zones:

(a)The Surface Meristem

(b) The Rib Meristem

(c) The Peripheral Meristem

(d)The Zone of Central Mother Cells

(e)The Cambium-Like Transitional Zone:

3. The Cryptomeria-Abies Type:

There are four meristematic zones:

(a)The Surface Meristem

(b) The Rib Meristem

(a) The Peripheral Meristem

(b)The Zone of Central Mother Cells

Reproductive Apex:

B. Apical Meristems –Root Apex:

- Apical root meristem is sub-terminal in **roots** The activity of apical meristem causes increase in the length of root.
    - **Apical Cell Theory:**
- This theory was put forth by Nageli.

-In the roots of vascular cryptogams (pteridophytes), e.g have a single tetrahedral apical cell. it is generally thought that by its division this gives rise to all the tissues of the root.

-Lower plants (Bryophytes and Pteridophytes) usually have a single apical cell.

-In Gymnosperms and Angiosperms, the apical meristem composed of a group of cells.

Intercalary meristem

- Intercalary meristem is commonly found in internodes of vascular plants
- They also occur in leaf sheath of some grasses.

Lateral Meristem

- They help in increasing diameter of the plant body by adding new cells to the existing tissues.
- Example: *Vascular cambium* and *Cork cambium (phellogen)*

- Vascular cambium is initiated between xylem and phloem within vascular bundles.

2. Classification based on nature of cell giving the meristem

Primary meristem

Primary meristems are the direct descendants of embryonic. Primary meristems give rise the primary plant body. Apical meristems are best examples for primary meristem.

Secondary meristem

They are the meristems developed from permanent tissues. Secondary meristem gives rise secondary tissue after primary growth. *Cork cambium and cambium.*