**ANNAI VAILANKANNI ARTS AND SCIENCE COLLEGE**

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**DEPARTMENT OF BOTANY**

**PAPER TITLE: ANATOMY AND EMBRYOLOGY (BY Dr. M. BASTIN)**

1. **Define epiblema**

The epidermal cells of rootlets, specially adapted to absorb liquids. Epiblema is the mostly outermost unilayered region with various unicellular root hairs. It consists of very thin-walled, mostly arranged living parenchymatous cells in plants.

1. **Cork cambium**

Cork cambium is a tissue found in many vascular plants as a part of the epidermis. It is one of the many layers of bark, between the cork and primary phloem. The cork cambium is a lateral meristem and is responsible for secondary growth that replaces the epidermis in roots and stems.

1. **[Vascular cambium](https://en.wikipedia.org/wiki/Vascular_cambium)**

The vascular cambium is the main growth tissue in the stems and roots of many plants, specifically in dicots such as buttercups and oak trees, gymnosperms such as pine trees, as well as in certain vascular plants. It produces secondary xylem inwards, towards the pith, and secondary phloem outwards, towards the bark.

1. **Companion cells**

This a type of cell found within the phloem of flowering plants. Each companion cell is usually closely associated with a sieve element. Its function is uncertain, though it appears to regulate the activity of the adjacent sieve element and to take part in loading and unloading sugar into the sieve element.

1. **Conjunctive tissue**

Sometimes lignified parenchymatous ground tissue in which the vascular bundles are embedded in certain dicotyledons (as the beet) and in those monocotyledons in which secondary thickening occurs.

1. **Periderm**

A group of tissues which replaces the epidermis in the plant body. Although periderm may develop in leaves and fruits, its main function is to protect stems and roots. The fundamental tissues which compose the periderm are the phellogen, phelloderm, and phellem.

1. **Phelloderm**

Inside of cork cambium; composed of living parenchyma cells.

1. **Phellogen**

Phellogen is defined as the meristematic cell layer responsible for the development of the periderm. Cells that grow inwards from there are termed phelloderm, and cells that develop outwards are termed phellem or cork (note similarity with vascular cambium). Anamalous secondary growth.

1. **What is the differences between vascular cambium and cork cambium?**

The vascular cambium and cork cambium are secondary meristems that are formed in stems and roots after the tissues of the primary plant body have differentiated. The vascular cambium is responsible for increasing the diameter of stems and roots and for forming woody tissue. The cork cambium produces some of the bark.

1. **Interfascular cambium.**

interfascicular cambium. [ ĭn′tər-fə-sĭk′yə-lər ] The cambium arising between the vascular bundles in the stem of a plant. See also fascicular cambium vascular bundle.

1. **Fasicular cambium**

Cambium that develops within the vascular bundles, producing secondary xylem and phloem.

1. **Define Storage parenchyma**

Storage parenchyma is specialized as large water storage tissue in many succulent and xerophytic plants with greatly expanded vacuole. The cells are chlorophyll-free and thin-walled.

1. **What is pericycle?**

The pericycle is a cylinder of parenchyma or sclerenchyma cells that lies just inside the endodermis and is the outer most part of the stele of plants. The pericycle is located between the endodermis and phloem in plant roots.

1. **Define cortex**

A cortex is an outer layer of a stem or root in a plant, lying below the [epidermis](https://en.wikipedia.org/wiki/Epidermis_%28botany%29) but outside the [vascular bundles](https://en.wikipedia.org/wiki/Vascular_bundle). The cortex is composed mostly of large thin-walled [parenchyma](https://en.wikipedia.org/wiki/Parenchyma) cells of the [ground tissue](https://en.wikipedia.org/wiki/Ground_tissue) system and shows little to no structural differentiation. The outer cortical cells often acquire irregularly thickened cell walls, and are called collenchyma cells. Some of the outer cortical cells may contain [chloroplasts](https://en.wikipedia.org/wiki/Chloroplast).

1. **Complementary cells**

Complementary cells are a mass of cells in plants, formed from the cork cambium at the position of the lenticels. It is a group of loosely arranged cells that aid in gaseous exchange through cork.

1. **Lenticels**

A lenticel is a porous tissue consisting of cells with large intercellular spaces in the periderm of the secondarily thickened organs and the bark of woody stems and roots of dicotyledonous flowering plants.

1. **Tyloses**

The term tylosis summarises the physiological process and the resulting occlusion in the xylem of woody plants as response to injury or as protection from decay in heartwood. It is a key process in wall one of the Compartmentalization of Decay in Trees (CODIT) and other woody plants.

1. **Differences between heart wood and sap wood.**

Sapwood is the outer light-colored portion of a tree trunk through which the water passes from the roots to the leaves, and in which excess food is often stored. Heartwood is the central core of the trunk. In most woods the heartwood can be distinguished from the sapwood by its darker color.

1. **Diffuse Porous**

In some species (e.g. maple, cherry and yellow poplar) the pores are distributed fairly evenly across the early wood and latewood. Most domestic diffuse-porous woods have relatively small-diameter pores, but some tropical woods of this type (e.g. mahogany) have rather large pores.

1. **Differences between spring wood and summer wood.**

springwood is the wood in a tree's growth ring formed earlier in the growing season, when growth is more rapid, thus composed of wider elements and usually lighter in colour while summerwood is the wood in a tree's growth ring formed later in the growing season, when growth is less rapid.

1. **Define secondary vascular tissues.**

The secondary vascular tissue arises from the vascular cambium, a layer of meristematic tissue insinuated between the primary xylem and primary phloem (see above Vascular tissue).

1. **Medullary rays**

Medullary rays (pith rays or wood rays) are sheets or ribbons of cells running from the inside of the plant to the outside. That is, they run at right angles to the xylem and phloem, which run vertically. While the plant is alive, these medullary cells are alive.

1. **Differences between monocot leaf and dicot leaf.**

The main characteristic feature that differentiates a monocot and a dicot leaf is that, the guard cells of stomata are kidney-shaped in dicot leaf and dumb-bell shaped in a monocot leaf. ... The vascular bundle is large in dicot leaf whereas in monocot leaf, both small and large vascular bundles are present.

1. **Define cuticle**

It is the outer waxy envelope that covers the epidermis layer. Dicot leaf has a thin layer of cuticle on both the upper and lower epidermis whereas Monocot leaf has thick cuticle on the upper epidermis and thin on lower epidermis.

1. **Define mesophyll cell.**

Mesophyll cells are a type of ground tissue found in the plant's leaves. ... The most important role of the mesophyll cells is in photosynthesis. Mesophyll cells are large spaces within the leaf that allow carbon dioxide to move freely.

1. **Differences between dicot root and monocot root.**

Within the seed lies the plant's embryo. Whereas monocots have one cotyledon (vein), dicots have two. This small difference at the very start of the plant's life cycle leads each plant to develop vast differences. Dicot roots also contain one main root called the taproot, where other, smaller roots branch off.

1. **What is casparian strips.**

Casparian strip is a band of cell wall material deposited in the radial and transverse walls of the endodermis, and is chemically different from the rest of the cell wall - the cell wall being made of lignin[1] and without suberin - whereas the Casparian strip is made of suberin and sometimes lignin.

1. **Bulliform cells**

These are the large, colourless, empty cells that attach to the upper epidermis that plays a significant function in rolling and unrolling of leaves. In dicot leaf, Bulliform cells are absent whereas, in monocot leaf, it is present.

1. **Define medulla.**

The medulla is the innermost layer of the hair shaft. This nearly invisible layer is the most soft and fragile, and serves as the pith or marrow of the hair. Scientists are still uncertain about the exact role of the medulla, but they speculate that it is primarily an extension that is more prominent in depigmented (grey or white) hair.

1. **What is root cap?**

The root cap is a type of tissue at the tip of a plant root. It is also called calyptra. Root caps contain statocytes which are involved in gravity perception in plants. If the cap is carefully removed the root will grow randomly. The root cap protects the growing tip in plants.

1. **Define fibrous root.**

A fibrous root system is the opposite of a taproot system. It is usually formed by thin, moderately branching roots growing from the stem. A fibrous root system is universal in monocotyledonous plants and ferns.

1. **Ground tissue.**

The ground tissue system is important because it serves a variety of essential functions for plants. Ground tissue is made up of three types including parenchyma, collenchyma, and sclerenchyma. Each type of ground tissue has its role, such as food creation and storage or support during and after growth.