Program Bachelor of Science.Second year

subject botany

semester 3

paper code BOC103

paper title, plant anatomy and Embryology.

Unit 2 primary structure of organs.

Module name structure of dicot monocot leaf.

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This module focuses on

the parts of monocot leaf, the transverse section of monocot leaf.

By the end of this session, the learner would be able to interpret the cross section and longitudinal section of a monocot leaf. Would be able to visualize the components and functions of monocot leaf.

A typical monocot leaf consists of a leaf sheath now in the dicot. The plant consists of the petiole that is the leaf stalk, which is absent in the monocot leaf. They consist of the leaf sheath, meaning the base of the Leafs around the stem in monocots. They have a comparatively long lamina then the dicots. They have a prominent midrib and they consist of nodes.

When we take a section of the long lamina, we get to see the following layers.

The upper epidermis, the mesophyll tissue, the vascular bundle and the lower epidermis.

Now let us first understand the upper epidermis, that is the first layer of monocot leaf. This layer consists of a thin cuticle over its border. Cuticle is a waxy layer which is thin and translucent. Cuticle makes the plant resistant to insect and fungal attack. The stomatas in monocot leaf are dumb Bell shaped. This is a characteristic features in monocot, they have a dumbbell shaped stomata.

Some of the cells in the upper epidermis are thick and large. They are called the bulliform cells. Bulliform Cells are hygroscopic in nature. They help the plant in rolling and unrolling of the leaf lamina when the weather changes. The main function of the upper epidermis is to protect this below tissues.

And also to check the rate of transpiration.

Moving on to the mesophyll.

Unlike dicots, here the mesophyll is not differentiated into palisade and spongy.

This tissue lies between the two epidermal layers, hence the name mesophyll, meso means middle and phyll means the leaf.

They are isobilateral in nature. When the leaf is not divided into Upper Palisade and lower spongy, we call such leaves as Isobilateral leaves.

The cells of this region are thin walled round and isodiametric meaning they are equal from all the sides they contain chloroplast. The cells have very small intercellular space. The main function of this region is photosynthesis. Moving on to the vascular bundle, they are present in the veins, The midrib of the leaf.

They vary in size. The midrib will have a larger vascular bundle, whereas the finer veins will have a smaller vascular bundle. These veins are embedded in the Mesophyll region. A Vascular Bundle consists of a thin layer of cells which are called the bundle sheath cells. These cells are parenchymatous in nature,

but as the plant matures they turn sclerenchymatous when they turn sclerenchymatous, they provide rigidity or mechanical support to the plant. These cells contain chloroplasts and starch grains.

Each vascular bundle has a Xylem towards the upper epidermis and phloem towards the lower epidermis.

The Xylem consists of two vessels. That is, the metaxylem and the Protoxylem.

As we can see from the image metaxylem can be easily distinguished from the Protoxylem. metaxylem consists of two large over vessels and protoxylem consists of a large cavity which is called as the lysigenous cavity.This cavity is formed when some of the cells starts dissolving. These cells can store water gases and lipids.

Surrounding the vascular bundle, there is a layer of sclerenchyma. This sclerenchyma helps the plant to maintain its rigidity. This also provides rigidity to the inner tissues. Vascular bundles in a monocot leaf are conjoint, collateral and closed type. Conjoint means Xylem and phloem are together. Collateral means they are on the same radii and closed, meaning they do not have a cambium region.

The main function of Xylem is to conduct water and supply it to the other parts of the plant.

The phloem carries organic substances and supplies to the other parts of the plant.

Moving on to the last layer of the monocot leaf, that is the lower epidermis. These cells are single layered. They are thin and they are flat in nature.

They consist of a thin layer of cuticle, again because of this cuticle region, the plant is able to protect itself from fungi and other substances.

It shows the presence of stomata along with the guard cells, the guard cells over here are dumbbell shaped. There are more stomata on the lower epidermis than the upper epidermis. This layer does not have bulliform cells associated with it.

These are some of the books which you can refer for your anatomy paper.

Thank you.