

Summary of online class taken on 17.4.2020

Study of Anatomical Details of Monocotyledonous Leaf

Plant Specimen: Leaf of *Polyanthes tuberosa* (Family: Amaryllidaceae); Tuberose

Observation: A thin section of the leaf reveals the following internal tissue organisation.

Epidermis:

1. It occurs on the **adaxial** and **abaxial** surface of the leaf and accordingly termed as **upper epidermis** and **lower epidermis**.
2. Epidermal layers are single layered.
3. The cells are rectangular in shape with rounded outer walls.
4. The outer walls are cuticularised.
5. The cells are compactly set.
6. The continuity of both the epidermal layers is interrupted by stomata.
7. A sub-stomatal chamber is present below each stoma.

Mesophyll:

1. It occurs between the two epidermal layers and is many layered.
2. Mesophyll tissue consists of a single type of cells.
3. The cells are more or less isodiametric.
4. The cells contain abundant chloroplastids.
5. The cells cannot be differentiated into palisade and spongy parenchyma.
6. The cells enclose intercellular space that are continuous to the external environment through sub-stomatal chamber and stomata.

Vascular Bundles:

1. The vascular bundles are collateral and closed.
2. The bundles are more or less of same size and shape, situated at regular intervals.
3. The phloem occurs towards the lower epidermis and xylem occurs towards the upper epidermis.
4. Above xylem and below phloem there occurs a patch of sclerenchyma.
5. Each vascular bundle is surrounded by a bundle sheath, composed of parenchyma cells.

Comment:

1. There are two epidermis, i.e., upper and lower.
2. Ground tissue is differentiated as **mesophyll tissue**.
3. Vascular bundles are **closed collateral**.
4. Xylem is **mesarch** (protoxylem lies in centre surrounded by lately developed metaxylem).
5. In each vascular bundle, xylem occurs towards upper epidermis and phloem occurs towards lower epidermis (**Inverted Vascular Bundles**).
.....Hence the supplied specimen is a T.S. of a **leaf**.
6. Stomata is present on both surfaces.
7. Leaves are not dorsiventrally differentiated.
8. Mesophyll tissues **of one kind**, i.e., **not differentiated** into palisade and spongy parenchyma.

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9. Vascular bundles are more or less of same size and shape, situated at regular intervals.

..... Hence the supplied specimen is a T.S. of a **monocotyledonous leaf**.

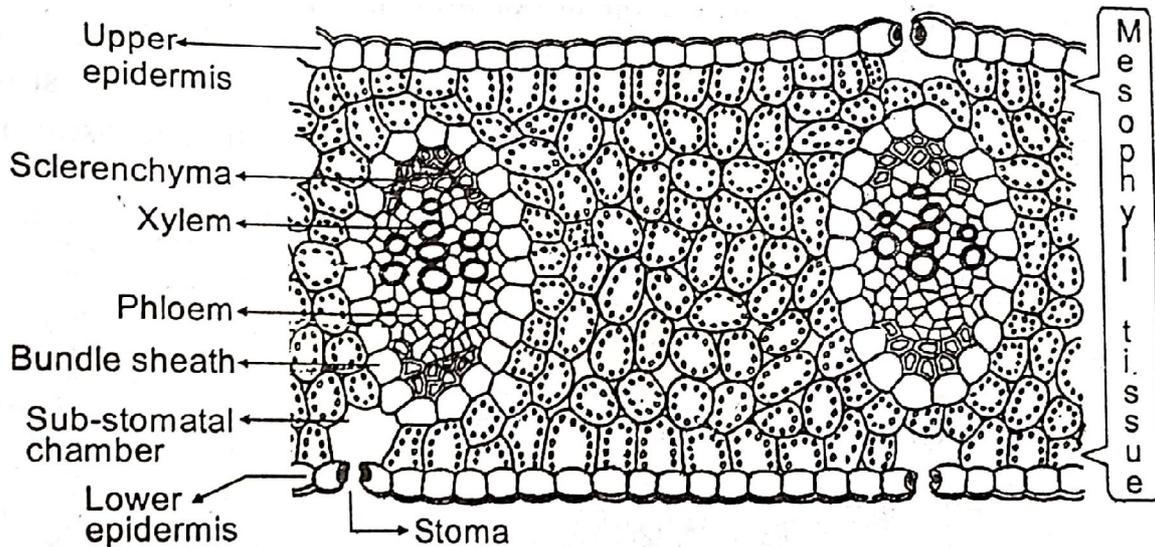


Fig. 25.49 : A portion of *Polianthes* leaf in transverse section.

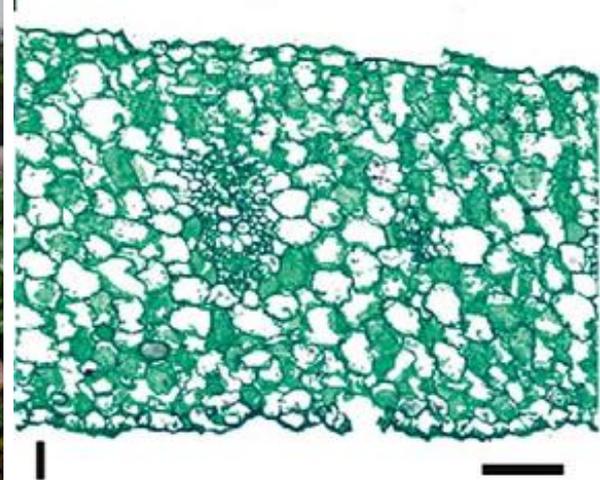
Things to do

1. Draw and describe the anatomical features of a monocotyledonous leaf in your practical copy.
2. Answer the following questions:
 - a) Write down the anatomical differences between dicot and monocot leaves.
 - b) Draw and describe the anatomical features of a typical monocot leaf.
 - c) Write the key identifying points for dicot leaf and monocot leaf. (3points for each specimen)

Scan and mail before next scheduled online class (TeamLink) on 22.4.2020 (Wednesday).



Polianthes tuberosa



Polianthes leaf anatomy