

CHAPTER-5: MORPHOLOGY OF FLOWERING PLANTS

Morphology:-

It is a branch of biology which deals with external characteristics of organism.

Parts of a Typical angiosperm

Root

It is typical non-green underground descending part of a plant that gives lateral branches and keeps the plant erect.

Characteristics:-

1. Non-green and non photosynthetic.
2. Descending and underground.
3. Nodes and internodes are absent.
4. It possesses unicellular root hair for absorption
5. Positively geotropic, hydrotropic but negatively phototropic

Parts of Root

Root Cap

The apex of root is covered by a thimble like structure called root cap. It protects the apex of root and makes its way as the root is continuously growing downwards

Zone of cell division

The apex of root is covered by a thimble like structure called root cap. It protects the apex of root and makes its way as the root continuously growing downwards

Zone of elongation

This zone is present just behind the meristematic zones whose cells does not divide but undergoes rapid elongation and enlargement which cause growth in roots

Root hair zone

It is the zone of maturation where a large number of unicellular root hairs are present.

Zone of Maturation

It is the uppermost region of root where the cells neither divide nor elongate but only mature.

Types of Root System

Tap root System

There is a main primary root (Principle root) which gives further branches as secondary and tertiary etc. In this root system the radical initially remains undivided.
Example: - All dicot plants - Mustard, Mango, Sesame etc.

Fibrous root System

In this type of root system the primary root is short lived as the radical is divided in the beginning and forms the large number of fiber like roots.

Adventitious Root System

In this type of root system the roots arise from the plant parts other than radical.

Example: - Banyan tree, Sugarcane, Maize, Grasses.

STEM

It is the main ascending erect axis of the plant which develop from plumage and epicotyls of the embryo

Characteristics:

It is generally erect and grows away from the soil. So, that is positively prototrophic and negatively hydrotropic and geotropic.

It posses nodes and internodes.

It forms various lateral appendages like leaves, branches, buds, flower etc. It also forms terminal buds.

Young stem is green and photosynthetic while old one is non-green.

Hair if born on the stem is generally multicellular Lateral branches are exogenous

Function of stem

- Perrenation - Helps plants to survive in unfavorable conditions as it store food for plant.
- Help in vegetative propagation.
- Help plant to protect from herbivorous animals by growing different structures.

LEAF

It is a thin, green, flat dorsiventral lateral and aerial part of a plant which is mostly involved in photosynthesis.

Characteristics of leaf:-

- Always born on the node of stem.
- In most cases there is an auxiliary bud in the axial of leaf.
- It is exogenous in origin and develops from leaf prim odium (Meristmatic tissue of leaf).
- It is green and performs photosynthesis.
- Each leaf has three main parts:-
 - Leaf base (hypo podium).
 - Petiole (Mosopodium)

c. Leaf lamina (Epipedium).

- The dicot leaf is known as dorsiventral leaf because its dorsal and ventral surfaces are different and contains stomata in more numbers on lower surface.
- The monocot leaf is known as isobilateral leaf as it contains equal number of stomata on both surfaces.

Leaf Venation

The distribution of veins and veinlets on leaf lamina is called leaf venation. It is of two types

Reticulate venation

The veinlets are irregularly distributed and form a network called reticulate venation. Most dicots have reticulate venation.

Ex:- Ficus, Mango (Magnifera indica), Cucurbita, Mulberry, Vitis vinifera, Papaya etc

Parallel Venation

In this all the veinlets run parallel to each other and don't form a network. Most monocots have parallel venation.

Ex:- Banana, Corn, Wheat, rice, millets, sugarcane, fan palm (Brassia), Bamboo, grasses etc.

Types of Leaves:-

1. **Simple Leaves**:- The leaves having a single lamina are called simple leaves. A simple leaf always contains a bud into its axil.
Ex:- Peepal, Ficus, Mango etc.

2. **Compound leaf**:- A leaf is called compound when the incisions of lamina reach up to the midrib and break into a number of leaflets. A leaflet doesn't contain any bud into its axil.

Types of Compound leaf:-

- Pinnate Compound leaves**:- The midrib also called rachis forms a number of leaflets.
- Palmate Compound leaves**:- When the two or more leaflets are attached at a common point
i.e. at the tip of petiole.

INFLORESCENCE

The arrangement of flowers on inflorescence axis or peduncle that is connected to the stem is known as inflorescence.

Peduncle: - Main axis of inflorescence.

Acropetal succession:- The new flowers arise on apex and mature flowers present on the base.

Centripetal succession:- The younger flower at centre and older at periphery.

Basipetal succession:- Younger flower at the base and mature are present at the apex.

Centrifugal succession:- The mature flowers are present at the centre while the younger flowers are present at the periphery.

TYPES OF INFLORESCENCE

Simple Racemose Inflorescence

The type of racemose inflorescence in which peduncle remains unbranched. The flowers arise in either acropetal or centripetal succession

Cymose Inflorescence

The peduncle (Main axis) is terminated into flower and further flowering occurs by the lateral branches below the terminal flowers. The arrangement of flower is either basipetal or centrifugal.

RIZZINGTALES

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