

# NEET- 2020- 45 Days Crash Course



**Date : 29th** July 2020

Chapter Name : MORPHOLOGY IN FLOWERING PLANTS

ROOTS STEM LEAVES

1

# Types of angiosperms

Branch of science which deals with the study of external form, structure and various modifications of plants is called Plant Morphology.



indica, Mangifera

Binnenleiant - Radish

Ex: Rose, Heena

Primary

Secondary

Root

System

root

Perennial herbs Ex: Turmeric.







### Modifications of tap root- Fleshy tap root



# Nodulated, Buttress and Reproductive Tap Roots

### 2. Nodulated roots

- Found in the plants of sub-family Papilionaceae.
- Roots develop numerous small or large irregular swellings called root nodules.
   Ex: Pea, groundnut and soyabean



#### 3. Buttress roots

 Irregular, broad, thick roots arises from the basal parts of main stem & spread in different direction. Ex: Bombax cieba.

### 4. Reproductive roots

Adventitious buds develop at some taproots or branches helps in vegetative reproduction
 Ex: Dalbergia, Populus
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# Pneumatophore or Respiratory Tap roots

### 5. Pneumatophore or Respiratory roots

Found in plants growing in mangroves or saline swamps near of the seashore.
 Ex: Rhizophora, Avicennia, Sonerattia.

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Pneumatophore or respiratory roots. A, mangrove tree With pnenumatophores coming out of mud. B, Pneumatophores with lenticels.

# **Modifications of Adventitious roots - Fibrous roots**

### 1. Fibrous roots

- Underground roots arises in groups either at base of the erect stem or nodes of a horizontal stem.
- They remain near the soil surface and are called surface feeders. Ex: Wheat.



## **Modifications of Fleshy Adventitious roots**



# **Modifications- Prop and Stilt Adventitious roots**

### 3. Prop roots

# -Pollar Root

- Piller like roots appear from large horizontal branches in trees.
- Grows downwards & enter into soil and provide mechanical support to the tree.
   Ex: Banyan (Ficus bengalensis).





Stilt roots of Maize.

# Modifications of Climbing or clinging Adventitious roots

### **5. Climbing or clinging roots**

- Arises from nodes (Ex: Betal), Internodes (Ex: Ficus-pumila) or both (Ex: Ivy).
- Penetrate cracks for the support (Ex: Pothos) or secreting sticky juice at their tips (Ex: Ivy).

Nade-eg Betal Indornodo-eg Ficus Jongo Winging Root



Fig:- Climbing or clinging roots. 1, Hedera nepalensis (Ivy, juvenile stage). 2, Betel (piper betle, Paan). 3, Pothos (Money Plant). 4, Tecoma (Campsis) radicans(Trumpet Flower).

# **Modifications of Contractile Adventitious roots**

### 6. Contractile roots

- Found in the underground stem of some plants.
- Apical part of these roots contracts and fixed the plant in soil Ex: Crocus, Allium cepa.



Fig:- Crocus: Contractile roots Fig:- Cuscuta. 1, parasite on host, 2, part of Cuscuta on host showing flowers and haustoria. 3, stem of Cuscuta showing haustoria. 4, stem of host showing pores of holes through which haustoria had entered.

# Parasitic, Epiphytic and Assimilatory roots

### 7. Parasitic or haustorial roots

• Occurs in parasites for absorbing nourishment from the host. Ex: Amarbel or Dodder (Cuscuta reflexa), Loranthus, Viscum

8. Epiphytic roots or hygroscopic roots

- Irregular, thick roots hanging in the air.
- Bears velamen tissue which absorbs humidity from atmosphere.

Ex: Orchid-Vanda

absorbanisting

- APria

Parlial

#### 9. Assimilatory roots

- Arises from the nodes of stem.
- Forms food through photosynthesis.

Ex: Trapa, Tinospora.

water chestnut

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Tinospora : Photosynthetic or assimilatory root



Vanda : Thicker epiphytic roots, narrow clinging and absorbing roots.

# Floating, Reproductive and Leaf roots

### **10. Floating roots**

Contains air which help for floating of aquatic plants on water surface.
 Ex: Jussiaea (Ludwigia).

### 11. Reproductive roots

• Adventitious buds arise on roots, which take part in vegetative propagation. Ex: Agave, Sweet potato  $\cancel{K}$   $(\mathcal{R} \ \mathcal{N} \ \mathcal{K} \not\in \mathcal{T})$ 

#### 12. Leaf roots

One leaf of each node is modified in to roots for balancing the plant in water.
 Ex.: Salvinia



Reproductive root of sweet potato with sprouts.

# Stem

• Stem is an erect ascending part of plant which develops from Plumute of embryo.

### Main characters of stem

- Bears Nodes, internodes, leaves, flowers & fruits.
- Positive phototropic and negative geotropic.
- Bears lateral branches, which arise exogenously from cortex.
- Hairs if present, they are multicellular. It has buds.
- Terminal bud of stem is responsible for the elongation of plant.



n'chome present

# Shape and functions of stem

Shape of stem	Description	Example
Cylindrical	Circular or cylindrical in shape	Lemon, shoe flower
Quadrangular	In cross section the stem appears four angled	Tulsi ( <i>Ocimum</i> )
	forming a square	
Triangular	Shows three angles	Cyprus rotundas
Flat	Stem is flat and leaf like	Opuntia
Ribbed	Stem bears ridges and furrows	Casuarina, Cucurbita
Ribbon shaped	Stem is either filamentous or ribbon like	Podostemon

### Function of stem

- Helpful to translocate water and mineral salts
- Translocate the prepared food from leaves to all plant parts.
- Produces new cells, tissues and organs every year, which are essential for the activity of plants.



## **Trailers and Runners**

# Procumbent

Decumbent

The shoots spread horizontally along the ground without rooting at intervals. Ex: Euphorbia Prostrate



Fig:- Euphorbia prostrata: Diffused trailer

#### Runner

**Trailers** 



# **Stolon and Offset**

### Stolon

Elongated horizontal branch arise from base of the stem.

Ex: Dracaena mint jasmine

modified Runner with Short internotes



Offset

Short horizontal branch producing a cluster of leaves above and cluster of roots below.

Ex: Pistia, Eicchornia



Fig :- Offsets : 1- Pistia. 2- Eichhornia.

### Sub aerial modifications of stem

