

CONTROL AND COORDINATION

CLASS -X
MODULE - 2

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MOVEMENTS IN PLANT

TYPES OF MOVEMENTS

- ① 1. TROPIC MOVEMENTS
- ② 2. NASTIC MOVEMENTS

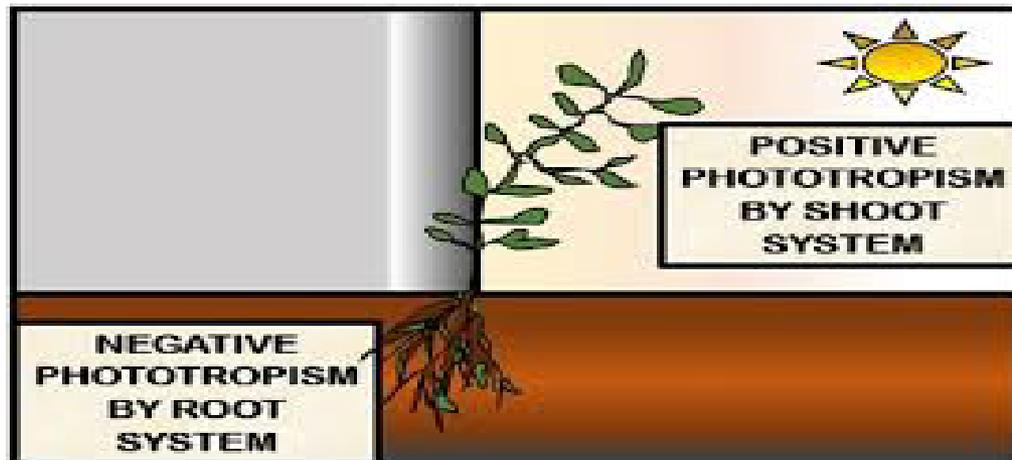


TROPIC MOVEMENT

- Movement of plant towards the stimulus is called tropic movement .

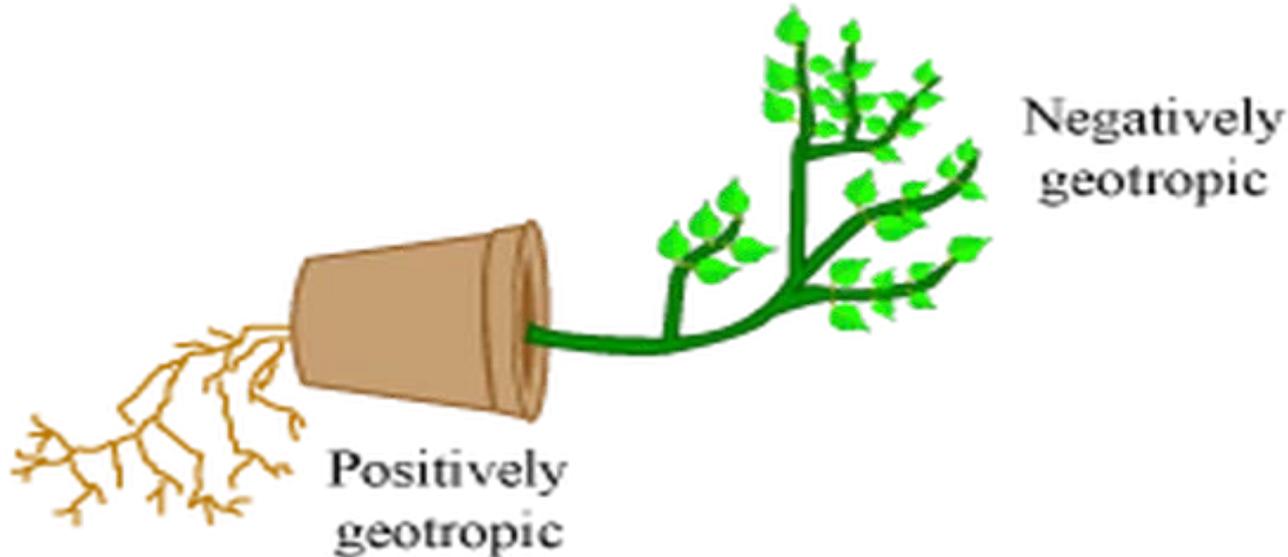
TYPES OF TROPIC MOVEMENT

- ◉ **Phototropism** - Movement of plant towards light is called phototropism.
- ◉ Shoot grow towards light.
- ◉ Shoot is positively phototropic while root is negatively phototropic .



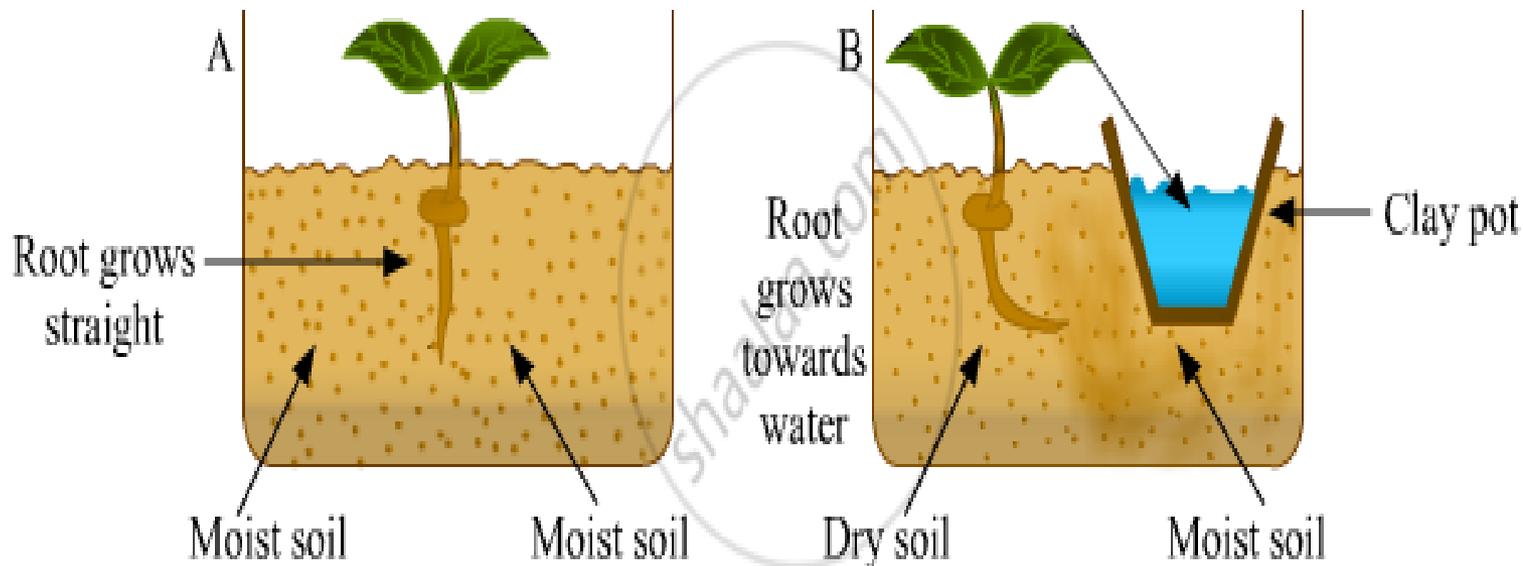
GEOTROPISM

- Movement of plants in response to gravity is called geotropism .
- Roots are positively geotropic and shoots are negatively geotropic .



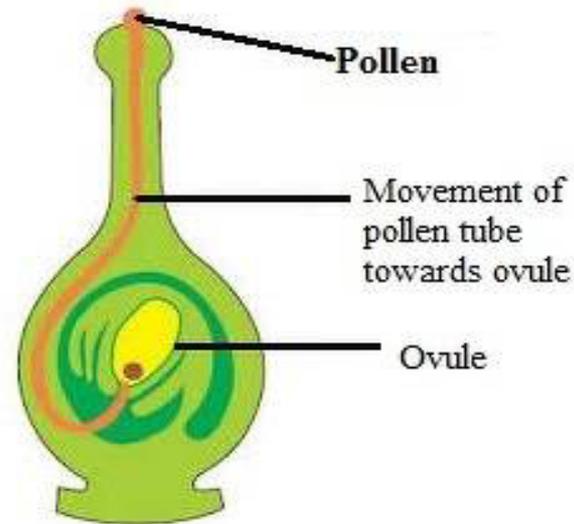
HYDROTROPISM

- Growth of plants towards water is called hydrotropism .
- Roots grow towards water.



CHEMOTROPISM

- Movement of plants towards chemicals is called chemotropism .
- Growth of pollen tube towards ovule is an example of chemotropism.



Chemotropism

NASTIC MOVEMENT

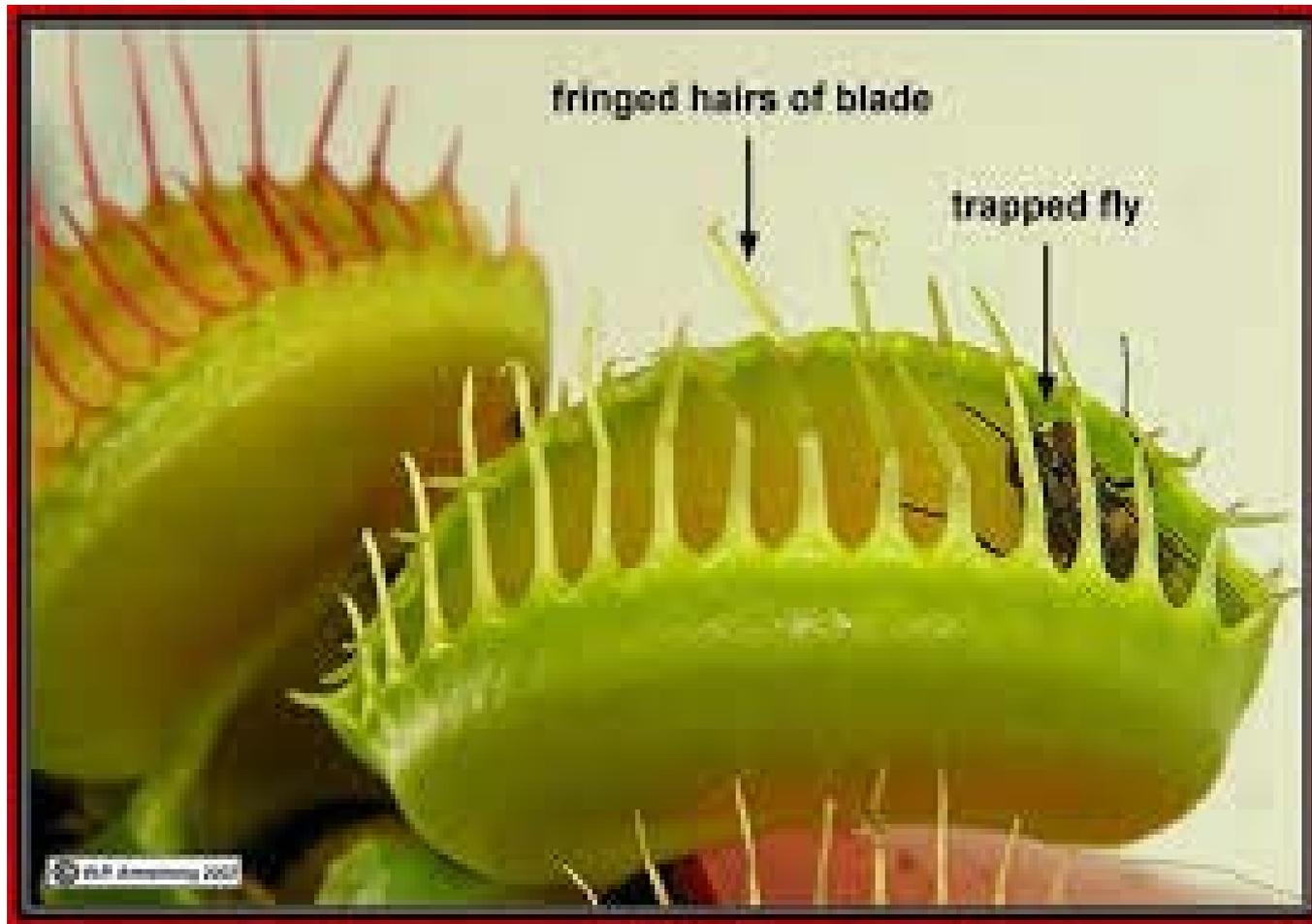
- ◉ Nastic movement is not a directional movement of the plant part with response to the stimulus. In nastic movement, from whichever direction the stimulus is applied, it affects all the parts of the organ of a plant equally and they always move in the same direction .

PICTURES OF NASTIC MOVEMENTS

- ◉ *Mimosa pudica* (touch me not)



VENUS FLY TRAP



4 O'CLOCK PLANT



DIFFERENCE BETWEEN NASTIC MOVEMENT AND TROPIC MOVEMENT

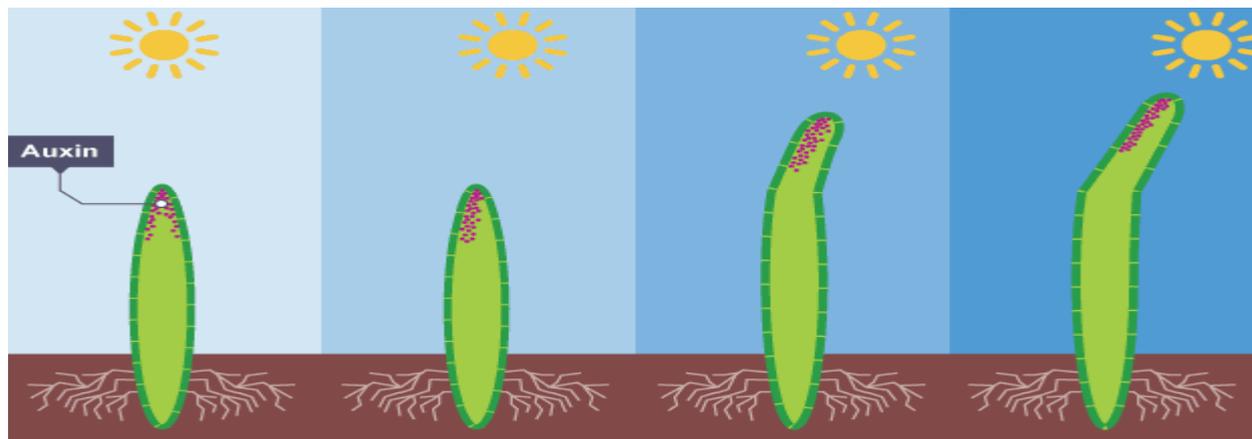
S.No.		Nastic movements	Tropic movements
1.	Growth	Growth independent movements	Growth dependent movements
2.	Time of action	Immediate	Slow
3.	Response to stimulus	Non-directional	Directional
4.	Reason for action	Change in turgor	Cell division
5.	Alternate name	Nastics	Tropism
6.	Examples	Folding of leaves of touch me - not (mimosa), opening and closing of stomata.	Phototropism, geotropism, hydropism, chemotropism.

PLANT HORMONES

- Plant hormones are signal molecules, produced within plants, that occur in extremely low concentrations. Plant hormones control all aspects of plant growth and development, from embryogenesis to regulation of organ size, pathogen defense, stress tolerance and reproductive development.

AUXIN

The auxin group of hormones has a wide range of uses in a plant. Auxin molecules are found in all tissues in a plant. However, they tend to be concentrated in the *meristems*, growth centres which are at the forefront of growth. These centres release auxin molecules, which are then distributed towards the roots. In this way, the plant can coordinate its size, and the growth and development of different tissues based on the gradient of the auxin concentration.



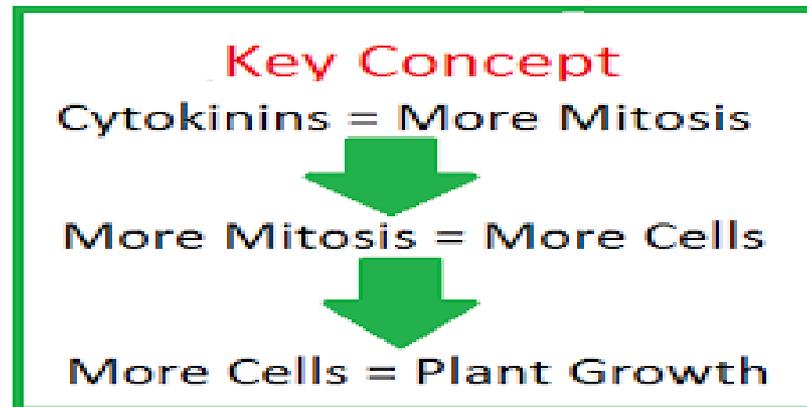
GIBBERELLINS

Gibberellin

- Found in meristems of apical buds and roots, young leaves and embryos
- In nature, gibberellin functions to:
 - Helps seeds and buds break dormancy (**germination**)
 - Makes stems lengthen
 - Influences leaf growth, flowering and fruit development
 - Influence root growth and differentiation
 - **growth**
- Applied by growers to enhance stem length, control ripening

CYTOKININ

Cytokinins (CK) are a class of plant growth substances (phytohormones) that promote cell division, or cytokinesis, in plant roots and shoots. They are involved primarily in cell growth and differentiation, but also affect apical dominance, axillary bud growth, and leaf senescence.



ABSCISIC ACID

Absciscic acid (ABA) is often referred to as an inhibitory rather than stimulatory hormone. It is involved in the closure of stomata, bud and seed dormancy and is known to inhibit other hormonal actions.

- ◉ Stimulates the closing of stomata in the epidermis.
- ◉ Inhibits plant metabolism and seed germination.
- ◉ Mainly involved in regulating abscission and dormancy
- ◉ Induces dormancy in seeds and helps in withstanding desiccation and other unfavorable growth factors.

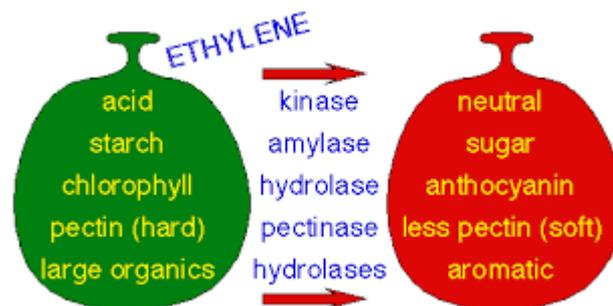


ETHYLENE

It acts as a growth promoter as well as inhibitor. It is a gaseous hormone .

Functions

1. Stimulating fruit ripening.
2. Helps in determining the sex of a flower.
3. It is involved in the production of female flowers in a male plant.
4. Promotes Apo-geotropism in roots.
5. Helps in the root initiation and pollination.
6. Ethylene increases the speed of leaf and flower senescence.
7. Induces seed germination.
8. Induces root growth to increase the capability of water and mineral absorption.



THANK YOU