Chemical Coordination in Plants

What is coordination in plants?

Coordination is the ability to use different parts of the plant together, smoothly and efficiently. In plants, coordination is due to the result of a chemical system, wherein plant hormones or phytohormones have a major role.

Plants exhibit two types of movements.

1. Growth-dependent movements called the Tropic Movements (towards or away from a stimulus).
2. Non-growth dependent movements called the Nastic Movements (independent of stimulus).

These can be classified again into 5 types. They are:

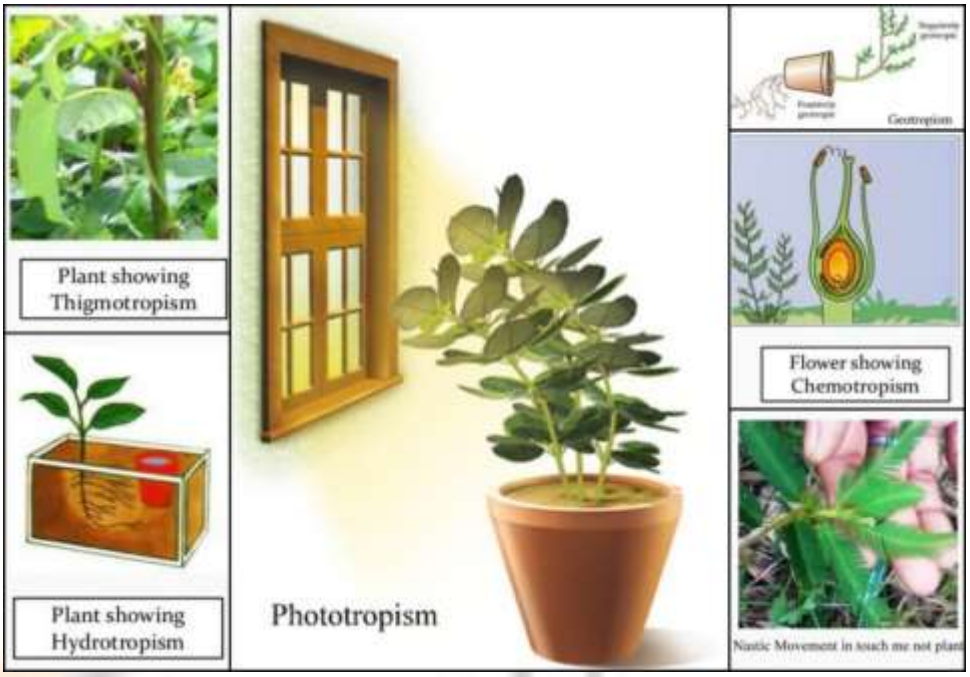
- Phototropism (light)
- Geotropism (gravity)
- Hydrotropism (water)
- Chemotropism (chemicals)
- Thigmotropism (touch)

1. *Phototropism* – It is the movement of plants in response to light. The shoot system of a plant exhibits this characteristic. The shoot moves towards the light.
2. *Geotropism* – It is the movement of a plant part towards the soil. This is a characteristic of the root system. The roots always move in the direction of the earth's gravity.
3. *Hydrotropism*– It is the movement of a plant towards the water. The stimulus here is water.
4. *Chemotropism* – It is the movement of plants in response to a chemical stimulus. A classic example of this type of movement is the growth of the pollen tube towards the ovule, during fertilization, in a flower.
5. *Thigmotropism* – It is a directional movement in plants in response to touch. For e.g. the plant tendrils climb around any support which they touch.

Nastic Movements:

Nastic movements in plants are not directional movements. They are not dependent on stimulus and are growth independent. For example, the leaves of a touch me not plant (*Mimosa pudica*),

fold up immediately when touched. These kinds of changes occur due to the changes in the amount of water in the leaves. Depending on the quantity, they either swell up or shrink.



Plant hormones or phytohormones:

They are responsible for the control and coordination of plants. There are different types of hormones, which affect the growth of a plant. Phytohormones are chemical compounds which are released by stimulated cells. These hormones are diffused around the plant cells. They have a role to play in the cell-division, cell enlargement, cell differentiation, fruit growth, falling of leaves, ripening of fruits, ageing of plants etc.

The different types of phytohormones are:

1. Auxins
2. Gibberellins
3. Cytokinins
4. Abscisic acid

Auxins – They help in the cell growth at the shoot tips. By elongating the cells, they help in the growth process.

Gibberellins – These hormones are responsible for the cell growth in the stem, seed germination, and flowering.

Cytokinins – They promote cell division in plants. They also promote the opening of the stomata and delay ageing in leaves.

Abscisic acid – This hormone inhibits the growth of the plant. And therefore, it promotes dormancy in seeds and buds. The detachment of fruits, flowers, and falling of leaves etc. are promoted by this hormone.