**Dr. Rima Kumari: Date: 04/09/2020**

Online class and e- content for BSc IIIrd year students

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| Date and Time | Online class medium | E. content topic |
| 04/09/2020  01:00 p.m to 1.40 p.m | Via Google meet  Link: Meeting URL: https://meet.google.com/wxy-qeey-jsn | **Plant Movement (contd)** |

(ii) **Paratonic movement of locomotion (Tactic movement):**These movements take place in whole small plants.  *e.g.,* chlamydomonas or small free ciliated organs *e.g.,* gametes. These movements are due to external factors like light, temperature or chemicals and are of following types:

(a) **Phototactic movements or phototaxisms :**It is the movement of free living organism towards or away from light. *e.g.*, movement of *Chlamydomonas, Ulothrix, Cladophora, Volvox* etc. towards suitable light intensity. Three types of arrangement present in columular cells in chloroplast of dorsiventral leaves.

* **Parastrophe :**In intense (maximum) light chloroplasts of cells arranged in longitudinal wall as a sequence manner.
* **Apostrophe :** In minimum light chloroplasts of cells arranged in different manner.
* **Epistrophe :** In dark chloroplasts of cells are arranged in transverse wall as sequence manner.

b) **Chemotactic movements or chemotaxisms** : It is the movement of plant or plant parts from one place to another towards or away from chemical substance. e.g., male gametes (antherozoids) of bryophyta move towards archegonia under the influence of sugars produced by neck canal cells and also in pteridophyta male gametes move towards archegonia due to the malic acid produced by disintegration of neck canal cells and ventral canal cells.

(c) **Thermotactic movements or thermotaxism** : It is the movement of free living organism in response to external stimuli of temperature. e.g., Chlamydomonas move from cold water to medium warm water and from very hot water to medium temperature.

(2) **Movement of curvature**:

In these cases, plants are fixed, thus they fail to move from one place to another. Somehow, movement is noticed in the form of bend or curvature on any part of the plant. Movement of curvature can be classified into.

(i) **Mechanical or Hygroscopic movements** : These movements depend upon the presence or absence of water and occurs in non-living parts of plants. It is of two types.

(a) **Hydrochasy** : This movement occurs due to the absorption of water.

Example : Peristomial teeth of moss protrude out when the capsule is dry and curve when capsule is wet. Spores of the Equisetum coil and uncoil in the presence and absence of water respectively.

(b) **Xerochasy** : This movement occurs due to the loss of water.

Example : When water is lost from the annulus of the sporangia of fern, it burst from stomium and spores are thus liberated out.

(ii) **Vital movement**: These movement are of two types :

(a) Growth movements : These movements are due to unequal growth in different parts of an organ and are irreversible. They are further divided into two types :

**Autonomic growth movements**

(i) **Nutation** (Nutatory movements): These movements occur in the growing stem of twiners and tendrils. The stem exhibits a kind of nodding movements in two directions. This is because the stem apex shows more growth on one side at one time and a little later there is a greater growth on the opposite side. It is called nutation. In spirally growing stems the region of greater growth passes gradually around the growing point resulting in the spiral coiling of stem and tendrils. Such a movement is called circumnutation. Coiling of a tendril after coming in contact with a support is a thigmotropic movement.

(ii) **Nasty movements** : They are non-directional movements in which the response is determined by the structure of the responsive organ and not the direction of the stimulus. The responsive organ has an asymmetrical or dorsiventral structure. Greater growth on one side causes the organ to bend to the opposite side. Greater growth on the adaxial side is called hyponasty. e.g., circinate coiling and closed sepals and petals in a floral bud. Whereas more growth on abaxial side is called epinasty. e.g., opening of fern leaf and spreading of sepals and petals during opening of the floral bud.