

Plant Hormones

1. What are gibberellins? Write the function of gibberellins. (1+3=4 marks) (2079)

-• Gibberellin:

- Weak acid plant growth hormone having gibberone ring structures which causes cell elongation and cell differentiation.

- Named after a fungus called 'Giberella fujikuroi'.

- Fungus caused a disease in rice seedling called "Bakane" (foolish seedlings = unusual) disease in Japan.

- Acidic in nature.

- 80 different Gibberellins are available - GA₁ to GA₈₀
- Commonly occurring gibberellins is GA₃.

Function of Gibberellins:

1. Stem and leaves growth:

- Elongates stem and leaves by cell elongation.

2. Elongation of dwarf shoot:

- Genetic dwarf varieties of plant (cabbage, maize, etc) can be induced to grow normal height by the application of GA.

3. Flowering:

- Promotes flowering in long day plants.

4. Bolting in rosette plants:

- Bolting: elongation of reduced stem.
- Example: Internodal distance in cabbage is very short and giving rosette appearance.
- Application of GA increases the internodal distance

5. Parthenocarpy:

- GA induce the formation of seedless fruits like tomato, pear, apple, etc in the horticulture.

6. Delayed fruit ripening:
- Fruit ripening of some plants can be delayed with the help of GA.

2. What are the root initiating hormones? Write the physiological effects of Auxins.
(1+3=4 marks) (2080)

- Root initiating hormones are group of hormones called auxins.

Physiological Effects of Auxins:

1. Cell division:

- Most important function of auxin, especially in the shoot

and root tip.

- Initiates the cell division in cambium.

2. Apical dominance:

- Phenomenon by which presence of apical buds does not allow lateral buds to grow.
- If apical buds removed lateral buds grow.

3. Parthenocarpy:

- Application of auxin (IAA, IBA) develop seedless fruits or parthenocarpic fruits.

4. Root formation:

- Promotes root formation in

the vegetative parts of plants.

5. Tissue culture:

- Auxins are widely used in tissue culture to induce callus and roots.

6. Germination:

- Auxin (IAA, IBA, NAA) widely used to break seed dormancy and increase germination.

- Cytokinins:

- Also known as Kinetin.

- Basic in nature.

Physiological effect of Cytokinins:

1. Cell division:

- Promotes the cell division.

- Most important function of cytokinins and involve DNA synthesis, mitosis, cytokinesis.

2. Cell elongation:

- Also promotes cell elongation.

3. Break apical dominance:

- Reduces apical dominance in plants.

- Function is antagonistic property of auxin.

OR (Promotes growth of lateral buds)

4. Breaking of seed dormancy:

- Cytokinins overcome the seed dormancy.

Eg: Tobacco.

- Induces seed germination.

5. Delaying ageing:

- Cytokinins delay the normal process of ageing in plants.

6. Protein synthesis:

- Cytokinin treatment increases rate of protein synthesis.

7. Flowering:

- Cytokinins have been found to induce flowering in certain plant species.

8. Initiation of inter-fascicular cambium:

- Cytokinines induce the formation of inter-fascicular cambium.