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# Plant Growth Regulater Harmone: AUXIN

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**Introduction:**

Auxin is also known as the '**Growth harmome' .** Auxin is the first growth harmone which is discovered in plants**.** Auxine is derived from' **Greek word' auxein** which means '**to grow'.** During the latter part of the nineteenth century **'charles Darwin'** and his son '**francis Darwin'** discovered auxin harmone in the coleoptiles of '**canary grass'.** But the main credit of the discovery of auxin harmone goes to the scientist **F.W. Went.** He isolated the auxin harmone from the tip of '**oats seedling' (*Avena sativa*).**

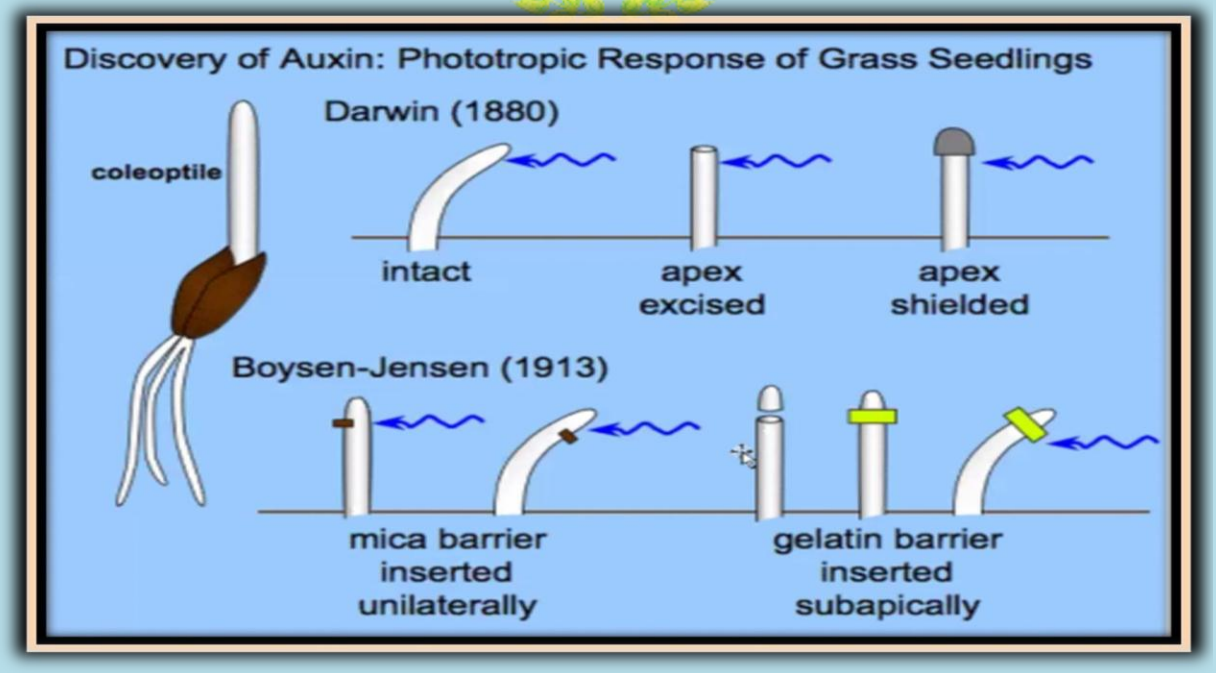
**Synthesis of auxin :**

Auxin synthesis occurs in both **Aerial portions of the plants and in**

**Roots;** thus the auxin requied for the development of roots could com from either part or both. In simple language auxins are generally produce by the **Epical part of Stem and Root .**

- **The precursor of auxin is 'Tryptophan'**

**There is a two pathways in Biosynthesis of Auxin :-**

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- **Tryptophan dependent pathway**

i. **IPA pathway**

ii. **TAM pathway**

iii. **IAN pathway**

iv. **Bacterial pathway**

- **Tryptophan independent pathway**

**Physiological Affect and Applications of Auxin:-**

1) **Epical dominance :** In most of the higher plants the growing epical bud inhibit the growth of lateral buds , this phenomena called **epical dominance** .

2) **Root Initiation:** Auxine helps to initiate rooting in **Stem Cutting**

3) **Flowering :** Auxin promote flowering in **Pineapple.**

4) **Abscission: Auxine helps to prevent Leaf drop in early stage.** But promote the Abscission of **Older mature leaf and fruits.**

5) **Parthenocarpy :** Development of fruits **Without fertilization** is known as **parthenocarpy.** Auxin promotes parthenocarpy .

6) **Herbicide and Weedicide:** Auxine use in the form of herbicide and weedicide **.**

**For example – 2,4 – D**

7) **Potato dormancy: MH (Mallic Hydride)** and **NAA (Nephthaline Acetic Acid )** keep lateral buds of **Potato tuber dormant .** Thus potato tuber can be store for longer Duration .

8) **Increase in Respiration: James Bonner (1953) ,**for the first time , recognized that auxin stimulate the process of reapiration . and such a direct relation between growth due to auxin treatment and the rate of respiration has been found . ***greater the growth , higher is the rate of respiration .***

9) **Increased resistance to frost damage:** In parnsip , the top resist damage by frost on treatment with **2,4,5 – T** in apricot fruits before the onset of frost resulted in less damage than the untreated fruits .

10) **Great Weapon of war: Agent Orange** was a **1:1** mixture of **2,4 – D** and **2,4,5– T** that was sprayed throughout the jungles of **vietnam** and followed by **Napalmbombs.** This resulted in the destruction of hundreds of square km. of **vietnam forests .**

Auxin when applied in greater concentrations on enemy crop fields by air may cause devastation of land and thus form the basis of what is called ***biological warfare .***

**Types of Auxin :**

1) **Natural Auxin :** These are Isolated from plants.

- Indole -3 – acetic acid **(IAA)**
- Indole – 3 – acetonitrile **, (IAN)**
- Indole -3 – acetaldehyde **, (IAc)**
- Ethilindoleacetate

- Indole – 3- pyruvic acid **(IpyA)**
- Indole – 3- ethanol , **(IetOH)**

2) **Synthetic Auxin :** These are artificially made or synthesis .

- Nephthalin Acetic Acid **(NAA)**
- 2, 4 – di chloro Phenoxy Acetic acid **(2,4 – D )**
- Pyruvic Acid **(IPA)**

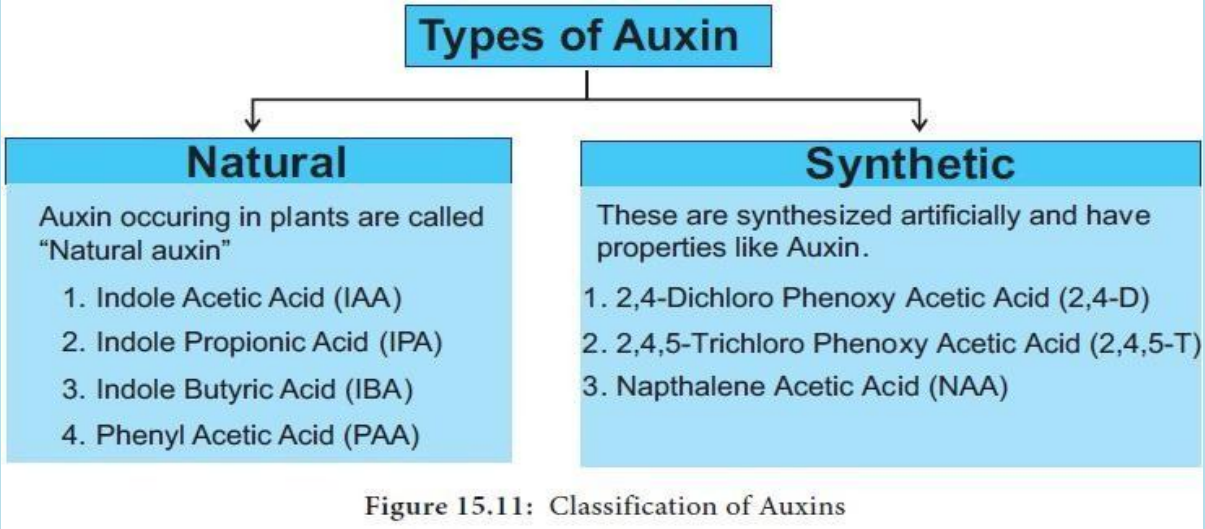
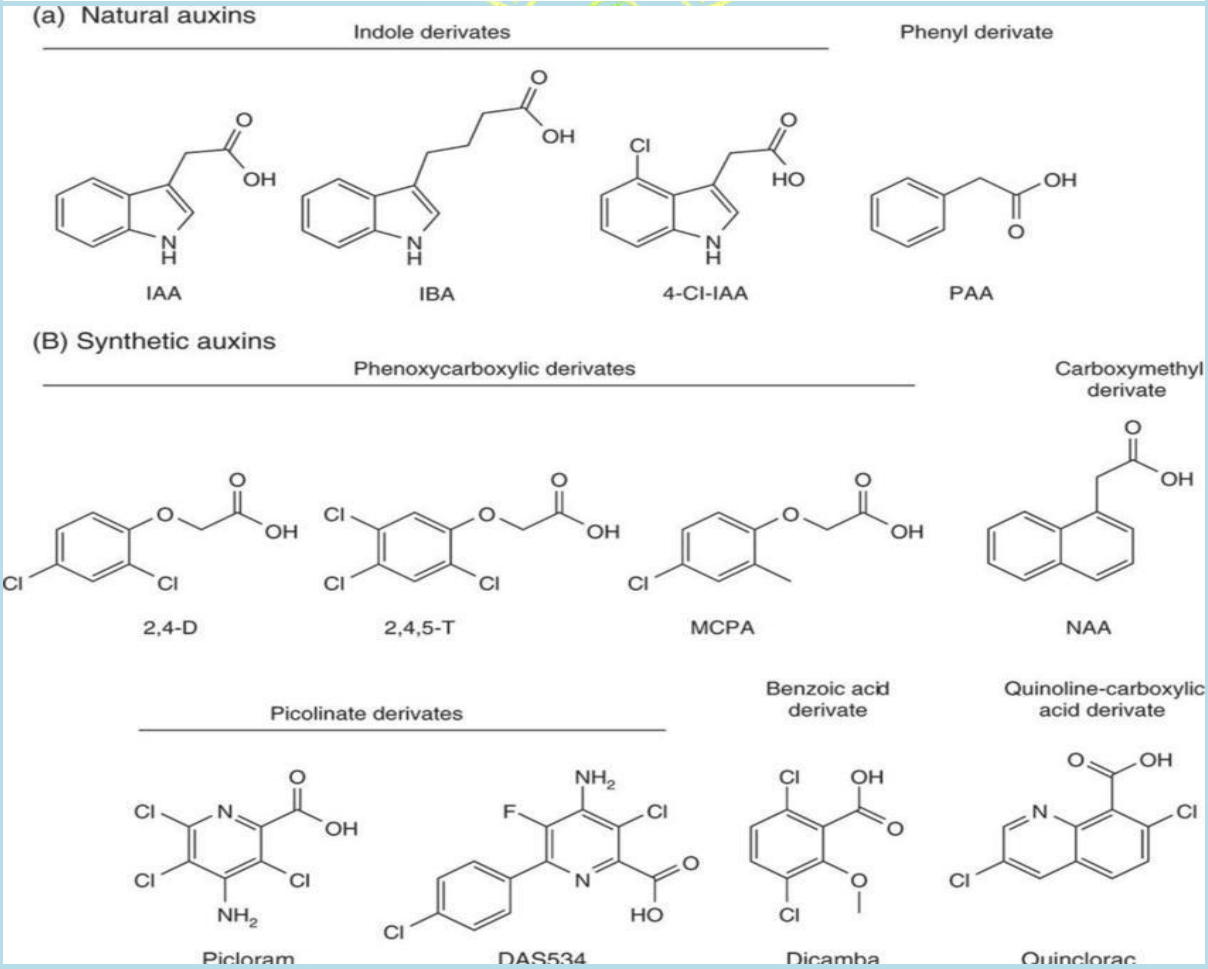



Figure 15.11: Classification of Auxins



**Bio Essay Of Auxin :**

The term bioessay refers to determining the amount of active substance present in the plant tissues .

1) One of the most commonly employed methods of bioessay of auxins , as devised by **'F.W. Went' (1928)** is known as '**Avena Curvature Test'** .

The test involves following steps :-

2) **Root Growth Inhibitor test** '

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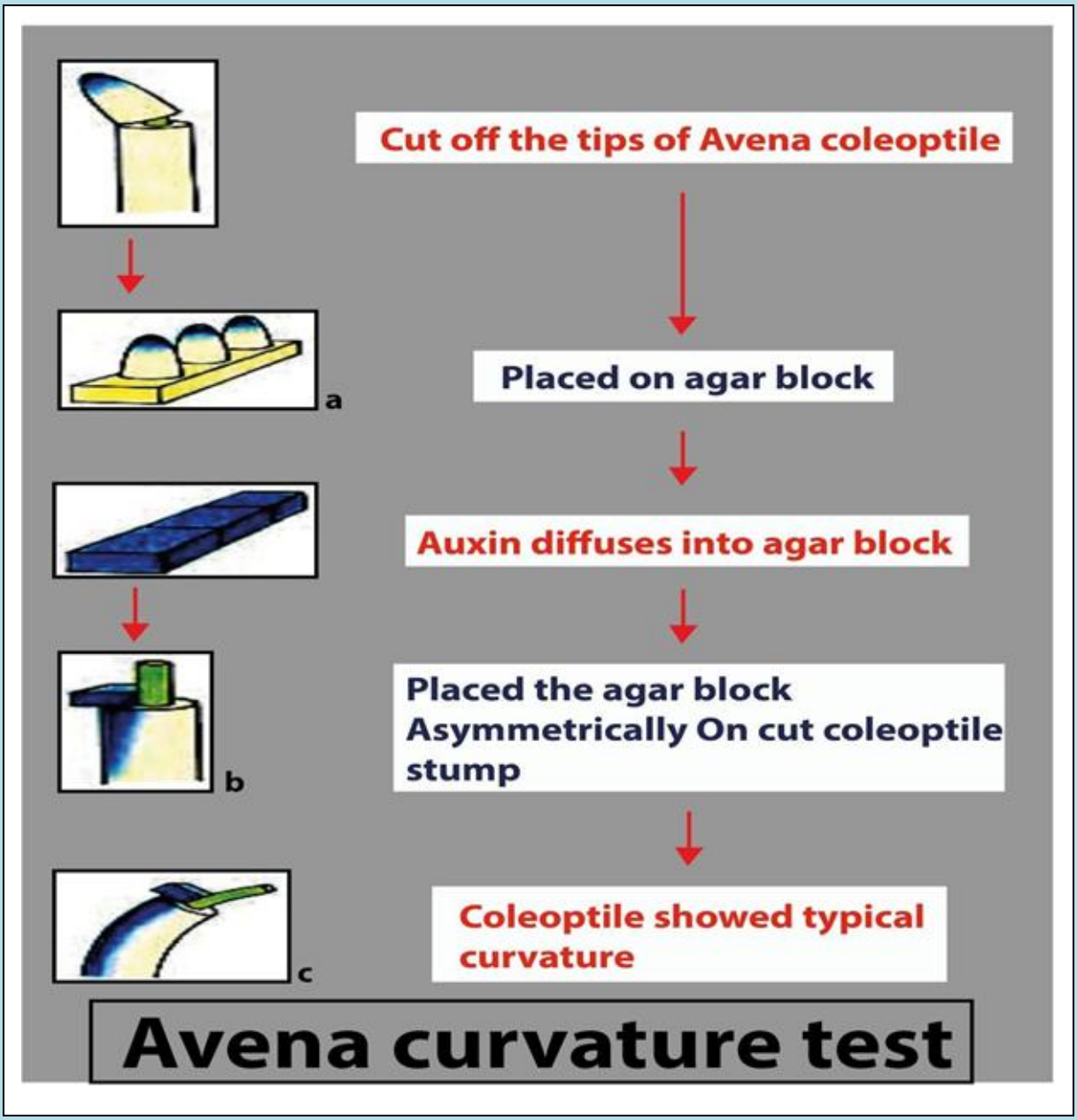

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