Culture Media – Nutrient Media –

Nutrition requirement for optimal growth of a tissue culture may vary with the species. Even tissue from different parts of a plant may have different requirement for the favorable growth of plant cell.

(a) Media Composition –

To maintain the vital function of a culture the basic medium contains inorganic nutrients, organic components, growth regulators & utilizible carbon sources & a gelling agents.

(b). Inorganic Nutrient –

Mineral elements play very important role in the growth of a plant.

ex- Mg^{2+}, is a part of chlorophyll.

Ca^{2+}, is a component of cell wall.

N, is an important element of amino acid.

Iron, Zinc, Molebednum are parts of certain enzyme.

Essentially about 15 elements are required for the favorable growth of a plant tissue

- Elements required in the life of a plant greater than 0.5 m.mol/lit or refered as macro-nutrient ~~Re~~ those less than 0.5 m.mol/lit as micro nutrient.

- The macro-nutrient elements includes 6-major elements, Nitrogen, P, Ca, Mg, S, K

- The micro-nutrients are required in small quantities but essential for proper growth of plant cell or tissue these Nutrient are B, Co, Fe, Mn, Zn & Mo.

② · Organic Nutrients -

Most cultured plant cells for capable of synthesizing essential vitamins but not in sufficient amount.

- To achive best growth it requires essential vitamins such as -
  Vit - B_1 - (Theamine).
  Vit - B_6 - (Pyrodoxine).
  Vit - B_5 - (Pentothenate).

· Carbon sources -

- The most commonly used carbon source is sucrose at conc. 2-5%.
  Glucose & fructose also known to be used for growth of some tissues.
- In general dicotiledenous roots grow better with sucrose where as monocots do best with glucose.

3. Growth Hormones -
In addition to the nutrients it is generally necessary to add one or more growth hormone.

Examples -

Auxins < Natural - IAA
Synthetic - IBA, NAA, 2,4-D.

Cytokinin < Natural - Zeatin
Synthetic - Kinetin, Gibrellins (GA)

- Auxin are use elongation of stem and internode and apical dominance and rooting etc.
- In tissue culture auxin induces all division and stimulate roote formation
  - IAA - Indole-3-acetic acid.
  IBA - Indole-3-butyric acid.
  NAA - Napthalene acetic acid.
  2,4-D - 2,4-Dichloro phenoxy acetic acid

Cytokinin -

It is a phytohormone naturaly in plant which are to start cell division.

Cytokinin
- Natural - Zeatin.
- Synthetic - Kinetin.

Gibrellins - (GA)

- GA are GA-3 (Gibrellic acetic acid-3) is the most common form of GA.
- It is used for parthinocarpy and apical dominant in plant.

Internodal galion of genitically plant is the most important property of GA.

- ## Solidifying Agents

Due to improved O_2 supply & support to the culture growth solid media are prefered for proper growth of cell. common solidifying agents are - Agar, Gelatin, alginate, Carriageenan, are used in culture media.