

PLANT - TISSUE CULTURE

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1. Introduction of our knowledge about tissue culture

- Bonhamel (1756).

- Gautheret's concept. 1905.

- Treculax " 1853

- Vochting 1878

- Wissner "

- Reichinger "

IDEA OF CELL CULTURE

Haberlandt. → Totipotency. →
cultured epidermal tissue.

Development of our knowledge about tissue culture.

Hannigh (1904) → Development of tissue culture
1st concept.

Weinkler

Kotte. → Root culture (1st time).

White

→ " " " "

1937 - 1959

Period of carrying out research
about role of different nutrients
in tissue culture (Bonner 1937;
Reisteron, Sheat).

Concept of Embryo culture. → Stem tip culture.

→ Role of growth regulators

→ Role of Auxin in int. culture

Hormonal Control of organ differentiation

How actually a single cell can be regenerated into a new plant. (Role of tobacco p. 1. g.).

Recent advances with context to India in tissue culture.

About 2-3 lectures

Media → 2-3 Periods.

Zygotic Embryo Culture

1. Work of Hannigh (1904)
2. Work of Leibach
3. Work of Pierich (1989)
4. Different techniques - types of embryos to be cultured.

a) Immature

b) Mature:

⇒ Different steps involved in embryo culture

a) Surface sterilization.

b) Excision of embryo.

c) Embryo endosperm transplant

⇒ Specific nutritional requirement

⇒ Role of suspensor in embryo culture.

⇒ Practical application of embryo culture.

i) Embryo rescue.

(ii) Overcoming dormancy.

iii) Shortening breeding cycle.

iv) To overcome seed sterility.

v) Production of Haploids.

vi) Clonal micropropagation.

Callus Culture

Tissue culture is the process whereby small pieces of living tissues (explants) are isolated from an organism and grown aseptically for indefinite periods on a nutrient medium.

For successful plant tissue culture it is ^{the} best to start with an explant rich in undetermined cells e.g. those from the cortex or meristem, because such cells are capable of rapid proliferation. The usual explants are buds, root tips, nodal stem segments or germinating seeds, and these are placed on a suitable culture media. ~~used for plants~~ where they grow into an undifferentiated mass known as callus.

Since the nutrient media used for plants can also support the growth of microorganisms, the explant is first washed in a disinfectant such as Sodium hypochloride or Hydrogen peroxide. Once established, the callus can be propagated indefinitely by subdivision.