

Application of PTC*

*Note: Most Important

I. Application of plant tissue culture -

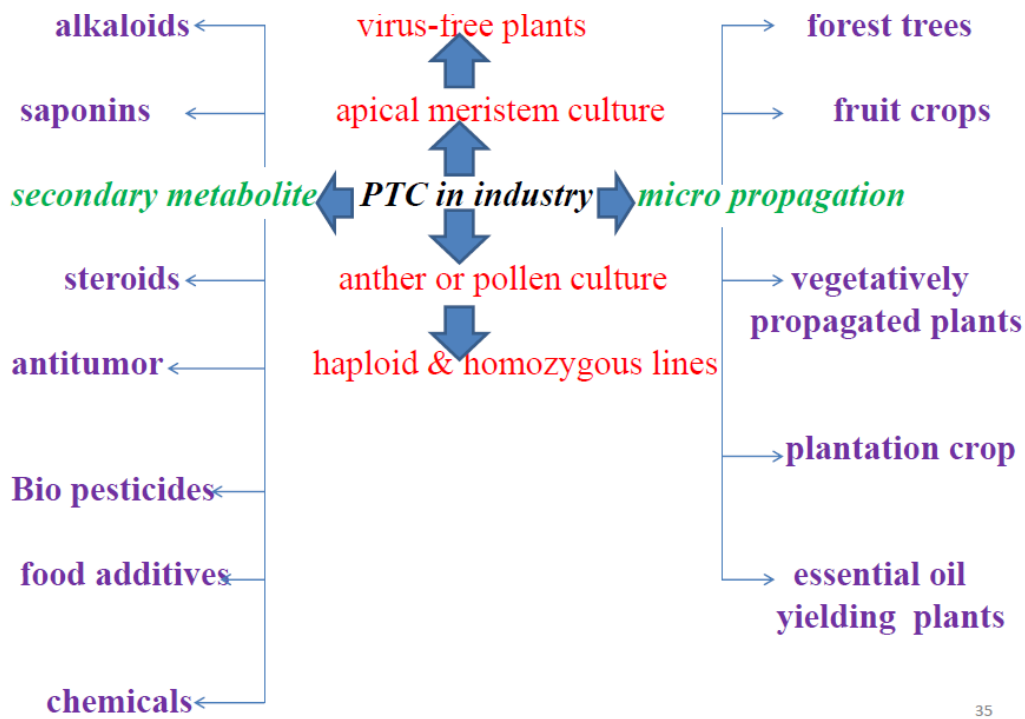
Plant tissue culture technique has been used in almost all the field of bioscience. Major ~~Megase~~ application are the listed below.

- ①. Production of phyto-pharmaceuticals.
- ②. Biochemical conversion.
- ③. Micropropagation.
- ④. Production of immobilised plant cells.

①. Production of phyto-pharmaceuticals -
Now a days pharmaceutical industry is using PTC as a source of variety of phyto-pharmaceuticals like- alkaloids, glycosides, steroids, terpenoids etc.

Name of Phyto-constituents	Plant Species	Culture type
① Atropine	<i>Atropa belladonna</i>	Hairy root.
② Caffeine	<i>Coffea arabica</i>	callus culture.
③ Cardenolides	<i>Digitalis purpurea</i>	Suspension "
④ Gincenoside.	<i>Panax ginseng</i>	Suspension "
⑤ Morphine	<i>Papaver Somniferum</i>	Suspension "
⑥ Nicotine	<i>Nicotiana tabacum</i>	Suspension "
⑦ Quinine &	<i>Cinchona</i>	callus &
⑧ Quinoline	<i>affinialis</i>	Suspension "
⑨ Reserpine	<i>Rauwolfia serpentina</i>	Suspension "

①. Industrial production of 2^o metabolites
 Majority of noble medicinal agents are produced by plant tissue culture technique from various type of medicinal plant.



②. Biochemical conversions - or
Biotransformations -

The conversion of small part of a chemical molecule by means of biological system is termed as Biotransformation.

Eg - Podophyllum peltatum in semi continuous culture can produce anticancer drug by biotransformation of synthetic Dibenzyl butanoid to lignan suitable for conversion to Etoposide.

③. Micropropagation - OR

Clonal propagation

Clonal propagation is the technique for rapid production of a large no. of identical clones, within a short duration in a limited spaces.

④. Immobilization of plant cells -

• Immobilization of plant cells or enzymes has increase the utilization of plant cell biotechnology for the production of pharmaceuticals.

• The plant cells can be immobilized by using alginates, Polyacrylamide, Polyurethane.

• Such methodology may be implemented in case of enzymes which are used as solid support for plant cells.

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Other application of plant tissue culture

- 1) Production of genetically variable plant
- 2) Virus eradication (apical meristem are generally virus free or very low conc. virus.)
- 3) The apical meristem is the only way to obtain a clone of various ^{disease} free plant
- 4) Study of crown gall by plant tissue culture
- 5) Importance of tissue culture in biotechnology
- 6) production of transgenic plant
- 7) production genetically variable plants