**Application of Plant Tissue Culture Technology with Special Reference to Cultivation of Horticultural and Medicinal Plants**

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**ABSTRACT :** Plant tissue culture is a collection of techniques used to sustain or grow plant cells, tissues or organs under sterile condition on a nutrient medium of known composition. In plant cell culture, plant tissue or organs are grown *in-vitro* on artificial media under aseptic and controlled environment. The technique depends mainly on the concepts of Totipotency of plant cells which refers to the ability of a single cell to express the full genome by cell division. Tissue culture practices (Micropropagation) make use of mostly Meristematic regions of desired plant to be propagated *in-vitro*. In this technique, all the cells in callus or suspension culture are derived from a single explant by mitotic division. Therefore, all plantlets regenerated from callus or suspension culture generally have the same genotype and constitute a clone. In addition, embryos which normally do not survive inside seeds can be grown in tissue culture to form new plants. Both apical and axillary meristems are free from viruses even if the whole plant is infected. Virus free plantlets are obtained by using meristem culture to grow new plants. Tissue culture techniques have been employed in rapid clonal propagation, somaclonal propagation, transgenic plants, induction and selection of mutation and resistance to herbicides. Cultivation of horticultural and medicinal plants using tissue culture techniques (Micropropagation) is very popular in India. India and China are being the two major producers of medicinal plants occupying more than 40% of global biodiversity. Horticultural and medicinal plants require cultivation via tissue culture techniques to ensure quality and purity, consistency in active ingredients as well as chemical constituents. Also, Micropropagation helps in conservation of many plant species from over exploitation. Tissue culture technology has been successfully used in the mass production of quality planting materials of many horticultural and medicinal plants. Furthermore, commercial kits have successfully been used in the propagation of slow growing plants. Uniformity in growth, maturity and harvesting makes tissue culture techniques ideal for optimum production of planting materials and in turn high profit rate for farmers. Large number of plantlets is produced in short period of time as well as flexibility in accordance with the planting seasons and market demand. The following some of the few plants have been successfully commercially cultivated in India viz; *Withania somnifera, Cassia augustifolia, Centella asiatica, Andrographis paniculata, Gymnema sylvester* and *Mucuna pruriens* among others.