

2.16.6 Applications of cell and tissue culture

Clonal propagation

In nature, the methods of plant propagation may be either asexual (by multiplication of vegetative parts) or sexual (through generation of seeds). Multiplication of genetically identical copies of a cultivar by asexual reproduction constitutes a clone, called *clonal propagation*. A population derived from a single individual by asexual reproduction constitutes a clone. Clonal propagation through tissue culture is popularly known as **micropropagation**. It involves *in vitro* propagation of selected genotype and the ultimate establishment of the plant in the field or a green house. Use of tissue culture for micropropagation was initiated by G. Morel (1960), who found this as the only commercially viable approach for orchid propagation. Plants obtained from tissue culture are called *microplants*. Microplants can be generated in three different ways:

- From pre-existing shoot buds or primordial buds (meristems) which are encouraged to grow and proliferate;
- Following shoot morphogenesis when new shoots are induced to form in unorganized tissues or directly upon explanted tissues of the mother plant;
- Through the formation of somatic embryos (called somatic embryogenesis).

There are five stages in micropropagation:

1. Preparation of explant
2. Formation of callus
3. Shoot development
4. Root formation
5. Transfer to a glasshouse

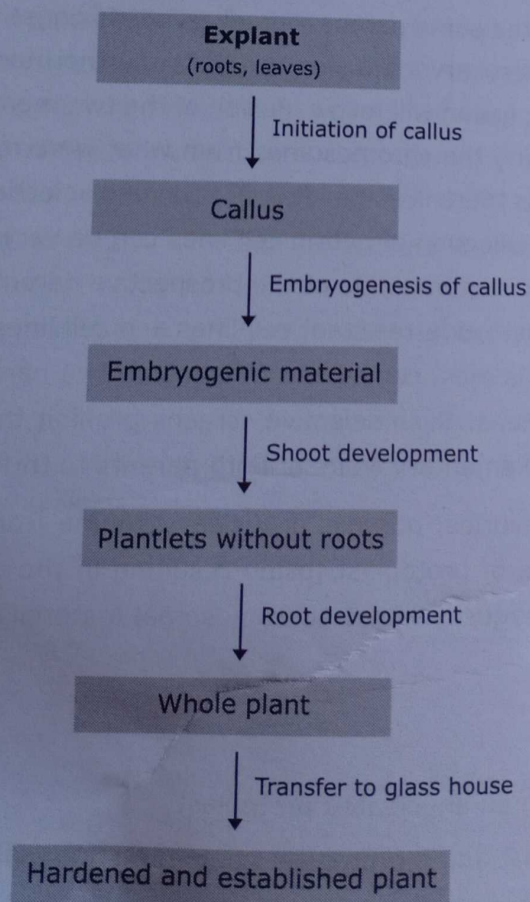


Figure 2.39 Process of micropropagation.