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Adventitious shoot differentiation from cultured stem disc, shoot bud and inflorescence explants of *Chlorophytum borivilianum* L.

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SUMMARY

Stem disc, shoot bud and inflorescence explants of *Chlorophytum borivilianum* Santapau and Fernandes (Safed musli), an important medicinal plant, were cultured on different MS media having different concentrations and combinations of auxins (IAA, NAA and IBA) and cytokinins (BAP and KIN). The different explants behaved differently on different media for the establishment of aseptic culture, their swelling and differentiation of shoots from them. The best explant and the best media for different responses were identified. Further, the development of roots from the base of *in vitro* developed shoots and acclimatization of plantlets resulted in development of an efficient protocol of the micropropagation of this important medicinal plant.

Key words : *Chlorophytum borivilianum*, Tissue culture, Shoot differentiation

Chlorophytum borivilianum L. Sontapau and Fernandes, a medicinal plant, commonly known as Safed musli because it yields milky white tubers on processing that contain saponins , responsible for its medicinal properties. Safed musli is one of the most important drug in Indian systems of medicine namely Ayurveda, Unani and Siddha due to its aphrodisiac and sex tonic properties. It is an integral part of more than 100 Ayurvedic formulations (Singh *et al.*, 2004). The natural availability of the plant is continuously decreasing due to its heavy demand and it faces extinction. To save the plant in its natural habitat, its cultivation is essential. Initiation and expansion of Safed musli cultivation will require substantial amount of quality propagules. Safed musli (*Chlorophytum borivilianum* L.) is generally propagated by seeds as well as vegetative propagules. Seed propagation has not become popular because of poor seed germination (Bordia *et al.*,1995) inferior quality of tuber in comparison to vegetatively propagated plants and seed plants taking longer period for maturity. Vegetative propagation through stem disc is better than seed propagation, but the method is costly and labour intensive.

Tissue culture or *in vitro* technique provides an alternative vegetative propagation method known as micropropagation. Micropropagation can lead to production of very large number of plants in relatively short time and space from a single mother plant. They are normally disease free, genetically uniform and show higher yield. To maintain genetic uniformity in micropropagated plants, they are multiplied through enhanced axillary branch formation. However, the plant of *Chlorophytum borivilianum* lacks a true stem and associated axillary branches. Therefore, the next best way of micropropagating these plants is through adventitious shoot differentiation or caulogenesis. The different explants can be exploited in culture to induce caulogenesis for the micropropagation of *Chlorophytum borivilianum* L.

MATERIALS AND METHODS

Stem disc, shoot bud and inflorescence of *Chlorophytum borivilianum* were used as explants for tissue culture experiment. These explants were washed and pretreated in a mixture solution of 0.1% streptomycin and 0.1% Bavestin for 30 minutes. The pretreated explants were surface sterilized with 0.2% mercuric chloride solution for 5 to 15 minutes. The sterile explants were inoculated on different MS media having different concentrations and combinations of auxins (IAA, NAA and IBA) and cytokinins (BAP and KIN) under laminar flow. The cultures were incubated at 25±2^{0}C under continuous fluorescent light of 1 K lux.

RESULTS AND DISCUSSION

The results obtained from the present investigation are presented below:

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