

### **IN VITRO PROPAGATION OF ORCHIDS AND CAPACITY BUILDING THROUGH MACROPROPAGATION IN DEHRADUN DISTRICT OF UTTARAKHAND**

In the present study protocol for *in vitro* propagation of *Cymbidium spp* through forced meristem-tip proliferation was investigated and developed. The procedure involved was collection of shoot-tip explants from mother plants maintained in polyhouse. Explants were pretreated with 1% Bavistin for 20 minutes followed by surface sterilization with 0.1% solution of mercuric chloride for 5 minutes and were inoculated culture medium. Protocorm-like bodies (PLBs) formation was observed on basal MS medium (Figure 1).

Knudson medium proved inferior to MS medium in terms of PLB induction from explants. A photoperiod of 16 hrs light and 8 hrs dark was found to be most suitable for PLB multiplication. PLBs so formed were excised subcultured on MS medium for *in vitro* multiplication of PLBs and subsequent shoot induction. MS medium with 0.5 mg/l BAP and 0.2% activated charcoal proved to be the best for PLB multiplication (Figure 2).

MS medium with 0.5 mg/l BAP + 0.2 mg/l NAA gave the best results for complete plantlet regeneration from PLBs (Figure 3). For root proliferation from induced shoots (as observed in some media combinations where PLBs resulted in formation of shoots alone) MS medium supplemented with 0.1 mg/l NAA gave the best results.

*In vitro* regenerated orchid plantlets were hardened *in vitro* on liquid basal MS medium for 2-3 weeks. Thereafter, the plantlets were shifted to polyhouse in flasks and kept for about 10 days before transferring them to pots only under favourable conditions. The plantlets were then shifted to pots containing suitable planting material and maintained in polyhouse. The plants showed proliferation of new shoots indicating that orchid plants can grow well in the region (Figure 4).

The technology was showcased to public by participation in Annual Flower Show “Basant Utsav”, Raj Bhawan, Dehradun with an aim to sound the interested growers and farmers about potential and benefits of *Cymbidium* orchid cultivation in the state. (Figure 5).

Linkages have been developed with an NGO “Dev Bhoomi Natural Products Producer Company Limited” (promoted by Appropriate Technology India -ATI) which shall work towards encouraging and supporting Orchid Culture in the hill districts of Uttarakhand. Its broad mission is to assist village communities in the Western Himalayan eco-region to conserve their natural resources while utilizing non timber forest products (NTFPs) in a socially equitable, economically efficient and ecologically sustainable manner. In the first phase, first lot of farmers from ATI was trained in orchid cultivation at Graphic Era University (Figure 6). Subsequently the trained growers can be supplied with tissue culture raised orchids to start their own venture in orchid cultivation.

## R & D Achievements

Uttarakhand State Council For Science & Technology

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Figure 1

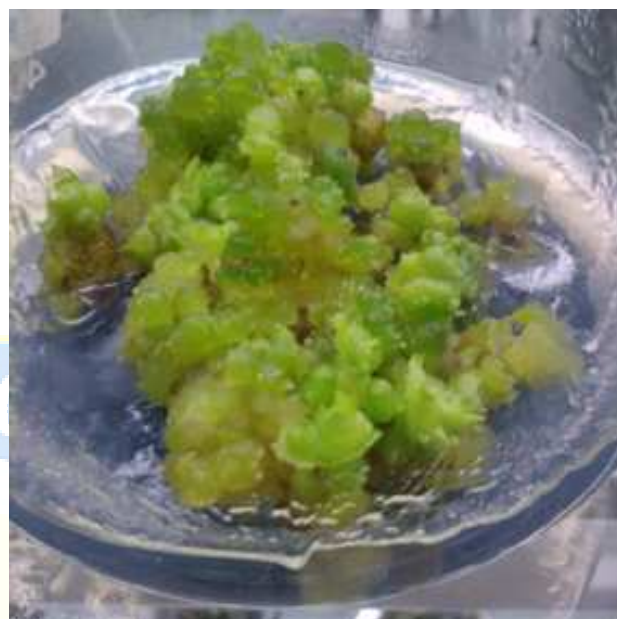


Figure 2



Figure 3



Figure 4

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Figure 5



Figure 6

