

## Adventitious root culture in *Podophyllum hexandrum* Royle (syn. *P. emodi* Wall. ex Hook.f. & Thomas) - An important medicinal plant

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*Podophyllum hexandrum* Royle belongs to the family Berberidaceae is an important Indian medicinal plant, which grows at 2700–4200 M in the Himalayan region. The rhizomes of this plant species are the source of podophyllotoxin, which is used for the synthesis of anticancer drugs and for several medicinal applications. The Indian *Podophyllum hexandrum* is superior to its American counterpart, namely, *Podophyllum peltatum* in terms of higher podophyllotoxin content (4% in the dried roots in comparison to only 0.25% for *Podophyllum peltatum*). The seed loses viability and poses problem in regeneration in natural habitat. In addition, the plants become endangered due to intensive collection and also owe its own biological characteristics. Zygotic embryos were used as explant for in vitro germination. MS medium supplemented with GA<sub>3</sub> (5.0 mg l<sup>-1</sup>) responded for in vitro germination of embryos into plantlets. Establishment of adventitious root cultures was achieved using root explants derived from in vitro seedlings. MS medium supplemented with IAA (3.0 mg l<sup>-1</sup>) in combination with NAA (3.0 mg l<sup>-1</sup>) was found to be the optimal concentration for the induction of callus from the root explants. Maximum number of adventitious roots (14.1) was obtained on MS Solid medium supplemented with IBA (1.5 mg l<sup>-1</sup>). The Morphological differences of the root induced in MS medium supplemented with IAA, IBA, IAA in combination with NAA has been observed and recorded. The fresh weight and length of the roots increased in the IBA treatment when compared to the other hormones tested. The plant cell and tissue culture technique discussed in this study is an alternative and a powerful protocol for the production of secondary metabolites. Considering these fact, adventitious root culture in large scale regarded as an attractive alternative for production of secondary metabolites of pharmaceutical and nutraceutical interest.

### Biography

M. Rajesh is pursuing Doctoral degree in Biotechnology under the guidance of Dr. A. Ganapathi, Professor, Department of Biotechnology and Genetic engineering, School of Biotechnology, Bharathidasan University, Tamil Nadu. He has experience in plant tissue culture and Agrobacterium mediated genetic transformation in medicinal plants. At present he is concentrating in adventitious root culture for secondary metabolite production.

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## A Critical study of Somatic embryogenesis in *Cucumis sativus*.L from seed cultures

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A protocol for the production of healthy in vitro plantlets directly from seed explants and somatic embryos from the seed derived calli of cucumber (*Cucumis sativus*. L) Was described. The seeds were excised from fresh fruit and cultured on Murashige and skoog (MS) medium supplemented with varied concentrations of BA (Benzyl adenine) and IBA (Indole butyric acid) for effective organogenesis which gave rise to healthy plantlets within short time duration on MS medium with BA 1.0 mg/l and IBA 0.3 mg/l.

The explants inoculated on 2, 4- Dichloro phenoxy acetic acid (2, 4-D 0.5 mg/l) for callus induction gave rise to luxuriantly growing calli after two weeks. These calli were sub cultured on MS medium supplemented with various concentrations of 2,4-D(1.0-2.0 mg/l) alone or along with Benzyl adenine(BA 0.25-1.0 mg/l) for shoot initiation. The efficient somatic embryogenesis was observed on full strength MS medium supplemented with 2, 4-D (1.0 mg/l) along with BA (0.25mg/l) within 45 days of time.

**Keywords:** *Cucumis sativus*, seeds, direct regeneration, callus, somatic embryogenesis.

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