In vitro multiplication of *Withania somnifera* (L.) Dunal (Amukkara) using nodal cuttings, shoot tips and leaf discs

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Withania somnifera (L.) Dunal is a very important medicinal plant, which belongs to family Solanaceae. It is widely used in Ayurvedic systems of medicine to cure diseases like leprosy, nervous disorders, intestinal infections and rheumatism. Mainly there are two cultivars based on structure of the roots. Roots are the most important part used in medicine. Tuberous roots which are imported from India have a starchy nature while the Sri Lankan cultivar has a fiber rich, tap root system with less starch content. Drug manufacturers mostly prefer to use the Indian cultivar because of its starchy nature in roots.

Although seed propagation is possible, percentage seed germination is very low. In Sri Lanka, there are no records on i*n vitro* propagation of *Withania somnifera.* Thus, developing techniques for mass propagation of this important Indian cultivar could benefit the country by reducing the cost for importation of the materials.

Nodal cuttings, shoot tips and leaf discs from tender leaves were used as explants. Explants were cultured on Murashige and Skoog (MS) basal medium supplemented with Kinetin, BAP and NAA.

Callus initiation was observed after 7 - 14 days of incubation in dark at 26 ± 1°C. Once transferred to 16 hr light, shoot initials which occurred over 20 - 25 days were observed in some explants in the same medium. After 40 days of incubation callus was cut equally (0.5 cm^3) into three and transferred into three different shooting media – MS medium supplemented with BAP (1.0 -3.0 mg / L) and IAA (0.2 mg / L)

Callus produced from leaf discs does not respond to any of the shooting media used. Rapid multiplication of shoots was observed in callus obtained from nodal cuttings in MS medium supplemented with 2.0 mg / L BAP and 0.2 mg / L IAA. (14.0 ± 0.01). It was lower in shoot tips (8.0 ± 0.10).

The time taken for callus initiation, nature of callus and pattern of shoot formation depend on the explant source. This may be due to difference in chemical compositions available in different parts of the plant. Although shoots were proliferated in the same media used for callus induction, the rate is very low. According to the results, it could be suggested that the best media for shoot elongation is MS medium supplemented with 2.0 mg / L BAP and 0.2 mg / L IAA and the best explant source for *in vitro* shoot multiplication is nodal cuttings.