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Micro propagation of amukkara (*Withania somnifera*) through nodal cuttings

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Withnia somnifera of family Solanaceae is commonly known as Amukkara, Ashwaganda or Winter Cherry is an important perennial medicinal herb with long tapering roots. The roots are widely used in ayurvedic medicine. To meets our annual requirement of 42,000 kg, importation from India by spending Rs.2 million is necessary (IUCN, 2005). Development of an *in vitro* method for mass production of this valuable species would substantially reduce the import cost and generate employment opportunities. This study was conducted to develop an *in vitro* protocol for mass production of *W. somnifera*.

Experiments were designed using a Complete Randomized Design with twenty replicates per treatment, Murashige and Skoog (MS) medium with different combinations of Benzene Amino Purine (BAP) and Naphthalene Acetic Acid (NAA) were tested with two levels of sucrose (30 g/l and 40 g/l)

both in liquid and solid forms for shoot proliferation. Nodal cuttings detached from *in vitro* derived seedlings were used as explants. Number of shoots per explant and average height per shoot per explant were recorded at two-week intervals. After two months, proliferated shoots were separated and cultured on quarter, half and full strength MS media where the effect of Indol Butyric Acid (IBA) and Napthaline Acetic Acid (NAA) on root initiation was evaluated in addition. Number of roots produced, branching habit of roots and average length of a root were recorded at two week intervals. Rooted plantlets were transferred to potting media containing cow dung, sand and coir dust in different combinations and growth performances were recorded at two week intervals.

Liquid MS medium containing 1.0 mg/l BAP with 40g/l sucrose level gave maximum number of shoots per plant (40) with highest average height (2.6 cm) after two months. Two weeks after transferring to rooting media, quarter, half and full strength MS media with 1.0 mg/l IBA produced roots. After a month full strength MS with IBA showed the maximum average length per root and half strength MS with IBA resulted in maximum number of roots (10) where full, half and quarter strength MS with IBA produced branches in roots while media with NAA resulted in calli at shoot ends. During the acclimatization, more than two weeks in a humid chamber, produced elongated shoots. Sand: cow dung 1: 1 ratio is the best potting medium to get branched plants with healthy leaves.

W. somnifera can be successfully *in vitro* propagated through nodal cuttings and after a chemical analysis the well-acclimatized plants can be used for large-scale production of active ingredients for medicinal purposes.

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