

Final report

on

**Comparison of growth and phytochemical identities
in *Withania somnifera* plants produced through
conventional methods and tissue culture
(ASP/6/R/2006/10)**

By

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Details of the project

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ABSTRACT

Withania somnifera (L.) Dunal (Sin: Amukkara, San: Ashwaganda) is a valuable medicinal plant, belongs to the family Solanaceae. *W. somnifera* is normally propagated by seeds but wall of the fruit contains a chemical which prevent seed germination.

Withania somnifera (L.) Dunal (Sin: Amukkara, San: Ashwaganda) is also a medicinal plant with high demand. The objective of this study was to develop successful protocol to acclimatize *in vitro* propagated plants of *Withania somnifera* and compare tissue cultured plants with seed raised plants based on growth, physiology, anatomy and chemically.

In the present study nodal segments, shoot tips and leaf pieces were used as explants in different growth regulator combinations (auxines and cytokinines). All tested explants produced calli and best callus production was observed in MS medium supplemented with 1.0 μM Kin, 4.5 μM BAP and 1.5 μM NAA under 14 days dark period. Shoot initiation was observed in the same medium from the calli produced from shoot tips and nodal segments. Highest shoot multiplication was observed in MS medium supplemented with 9.0 μM BAP and 1.0 μM IAA. Callus produced from leaf pieces did not respond in any medium to produce shoots. No significant difference was observed among tested treatments for rooting, suggesting growth regulator free MS medium was the best medium for rooting of *W. somnifera*. *In vitro* produced plants were acclimatized successfully in a potting mixture of river sand: top soil: compost in 2: 1: 1 ratio. Rate of photosynthesis was higher in tissue cultured plants at three months and six months compared to seed raised plants. TLC finger prints and densitometry was used to compare chemical identities (steroids considered) and it was found that there is no significant difference in chemical identities present in tissue cultured and seed raised plants.