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CONSERVATION OF MEDICINAL PLANT – *TINOSPORA CORDIFOLIA* THROUGH TISSUE CULTURE TECHNIQS

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ABSTRACT:

As per the Red List of threatened species 44 plant species are critically endangered, 113 endangered and 87 vulnerable (IUCN, 2000). Many medicinal plants are also suffering from over harvesting and habitat loss. Population growth, development and the unlimited collection of medicinal plants from the wild is causing in an over-exploitation of natural resources. Therefore, the management of traditional medicinal plant resources has become a matter of urgency. Demand of increasing medicinal plants based medicines warrants their mass propagation through plant tissue culture strategy. Tissue culture technology is potent and has opened extensive areas of research for biodiversity conservation. Tissue culture protocols have been developed for a wide range of medicinal plants, which includes endangered, rare and threatened plant species. In this work medicinal plant *Tinospora cordifolia* is selected for the study.

KEYWORDS: Medicinal Plants, Conservation Plant Tissue Culture, *Tinospora cordifolia*.

INTRODUCTION:

Tinospora cordifolia (Willd.) Miers ex Hook. F and Thoms commonly known as Guduchi is a large, deciduous climbing shrub of the family Menispermaceae. It is found throughout India, typically growing in deciduous and dry forests. The leaves are heart shaped. The succulent bark is creamy white to grey in colour with deep clefts spotted with lenticels. It puts out long, slender aerial roots, often growing on mango or neem trees. Flowers are yellow, growing in lax racemes from nodes on old wood. Fruits are drupes, turning red when ripe. 'Guduchi' is an important drug of Indian medicines since times immemorial (Chopra, 1965). The drug is well known Indian bitter and prescribed in fevers, diabetes, dyspepsia, jaundice, Urinary

problems, skin diseases, chronic diarrhea and dysentery (Misra & Bhava, 1969). The plant is conventionally propagated by cuttings. The conventional methods cannot meet the increasing demand of this plant used as a raw material. We therefore investigate the most suitable in-vitro micro-propagation protocol for the production of *Tinospora cordifolia*. (Khosa, 1963) Here, we report an efficient micro propagation protocol which can be used at a large scale for the clonal multiplication of this plant species using nodal segments as explants derived from the adult plants and followed by the optimized conditions for in-vitro rooting and further transfer into the green house (Sharma, 1969).

MATERIALS AND METHODS:

The fast production of pathogen free plants is one of the fundamental goals of plant tissue culture. Fungal contamination was serious problem during the establishment of *Tinospora cordifolia* explants on medium. Pretreatment is required before the explants was used for plant tissue culture. For the Pretreatment of the explant with Bavistin and Neem powder (45 min) was used to avoid contamination. This pretreatment was very much successful in reducing the rate of contamination. The experiments were conducted using the shoot tip, nodal and the leaf of *Tinospora cordifolia* as an explant. Under aseptic condition, the explants were surface sterilized with 0.1 % of HgCl₂ for 6 min. and finally washed six times with sterile water. The sterilized explants - nodal segments were inoculated onto MS medium containing 30grms/l sucrose, 7.5grms/l agar (Murashige and Skoog, 1962). Explant from nodal plant part results very well. The aseptic nodal segments were used for the establishment of best shoot proliferation medium by transferring them on MS medium supplemented with 0.3 mg/l BA, 0.7mg/l NAA. The multiple shoots were isolated and transferred (after 5 weeks) to MS medium containing different concentrations of BA (0.4-1.3 mg/L) and IAA (0.3-1.2mg/L) for root induction. Subsequently 4 weeks later, the rooted shoots were transferred to the plastic pots containing a mixture of soil for further growth.

RESULTS AND DISCUSSION:

Pretreated Nodal segments of *Tinospora cordifolia* by Neem powder were successfully established on MS basal medium and the rate of fungal contamination cultures was reduced due to pretreatment. Appearance of 1-2 leaves from each nodal segment was noticed after 20 days. Among the all 50 inoculation only 8 inoculated tubes were contaminated, it shows the successful use of Neem powder in the pretreatment. After Rooting and transfer to the cage, survival rate of the plant was 95%.

CONCLUSION:

The efficient pretreatment was identified and established for the culture and multiplication of the *Tinospora cordifolia*. The success rate of experiment shows that pretreatment through Neem powder provides good results. This can be useful for the mass propagation of the plant and also reach the demand of the raw material to the herbal medicinal industries.

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