

**EXCECUTIVE SUMMARY OF THE UGC MINOR PROJECT**

**INFLUENCE OF ABIOTIC STRESS SIGNALS ON SECONDARY METABOLITE  
ACCUMULATION IN *IN VITRO* CULTURES OF *OLDENLANDIA CORYMBOSA*  
LINN. - AN IMPORTANT ANTITUMOUROUS AND ANTIMALARIAL  
MEDICINAL PLANT**

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The potency of plant cell, tissue and organ cultures to produce many valuable chemical compounds as the parent plant in nature has been identified almost since the inspection of *invitro* technology. The regular increasing demand in world market place for natural, renewable products has refocused attention on *in vitro* plant materials as potential factories for secondary phytochemical products, and has paved the way for the new research exploring secondary product expression *in vitro*.

Secondary metabolites have played a significant role in medicine since ancient time period. Plants have been directly used as food and herbs in the organized traditional medical systems such as Ayurveda , Unani and traditional Chinese medicine for the treatment of various diseases for thousands of years .Extensive literature survey reveals that *Oldenlandia corymbosa* L. has a long history of traditional uses and that have been proved by many research works. The plant extract and some of the iridoid glycosides have been isolated from the plant have shown a variety of pharmacological activities like antioxidant, analgesic, anticancer, antibacterial, antiulcer, antimalarial, uterine contraction and hepatoprotective.

The aim of the work was to study the *in vitro* shoot regeneration from the nodal explants and analysis of the effect of different plant growth regulators and elicitors on *invitro* secondary metabolite production.

Through *in vitro* culture studies of *Oldenlandia corymbosa* L. suitable media with proper proportions of growth regulators were found. These growth regulators induced direct multiple shoots and indirect shoots formation in the cultures of the plant.

Nodal explants of *Oldenlandia corymbosa* L. were cultured on MS media supplemented with different concentrations and combinations of cytokinins and auxins. From the observations made at regular intervals, it can be concluded that the shoots were formed in MS medium supplemented with 3 mg/l BAP, 1 mg/l NAA+2 mg/l BAP and 3 mg/l kn from

the nodal explants. Callus formation observed in MS medium supplemented with 1 mg/l NAA+2 mg/l kn.

Biochemical analysis revealed that metabolite production in *invitro* cultures of show variations with growth regulators and elicitors used in the study. Of the various combinations tested terpenoid and phenolics production was observed when cultured on MS +3mg/l BAP+0.5mM Salicylic acid and MS +3mg/l BAP+1mM Salicylic acid. In other combinations used, terpenoids, alkaloids, phenolics, flavones and flavonones were not present in detectable quantities.

In the present studies variations were observed in metabolite production with growth regulators and elicitors used in the media. Salicylic acid was found as very effective in inducing the production of terpenoids and phenolics in cultures of *Oldenlandia corymbosa* L.

#### **OUTCOMES EMANATED FROM THE PROJECT**

- Standardised protocol for *in vitro* propagation of *Oldenlandia corymbosa*
- Standardised growth regulators for the production of secondary metabolites in *Oldenlandia corymbosa*
- Standardised pH for the production of secondary metabolites in *Oldenlandia corymbosa*

Standardised nutrient concentration for the production of secondary metabolites in *Oldenlandia corymbosa*

Standardised concentration of elicitors for the production of secondary metabolites in *Oldenlandia corymbosa*