

UNIVERSITY GRANTS COMMISSION

Executive Summary of the UGC Minor research Project

“Use of Ozone as a stimulant for enhancing secondary metabolites (Flavonoids and Coumarins) in cultured plant cells”

Dr.K.M.SRINANDHINIDEVI

In vitro culture is one of the important tools of plant biotechnology that exploits the totipotency character of plant cells, a concept proposed for the first time by Haberlandt in 1902. Clonal propagation through tissue cultures offers an alternative to vegetative practices used in the past and has the potential to provide high multiplication of uniform genotypes, resulting in short term gains. Through *in vitro* micropropagation, the increasing demand of product can be met easily and the technique also offers an opportunity to develop new germplasm and conservation. *Chrysanthemum indicum* Linn and *Chrysanthemum morifolium* are traditionally reported for the having larvicidal activity (sarita *et al.*, 2012), Antiarthritic (Surender Singh *et al.*, 2011), anti-inflammatory and immunomodulatory (Cheng *et al.*, 2005) and hepatoprotective activity. The aerial parts (stem, leaves and flowers) of *Chrysanthemum* to treat hypertensive symptoms and several infectious diseases, such as fever and stomatitis. Its flowers are also commonly used as tea to treat some eye disease. Plant secondary metabolism produces products that aid in the growth and development of plants but are not required for the plant to survive. Secondary metabolism facilitates the primary metabolism in plants. Although researchers know that this trait is common in many plants it is still difficult to determine the precise role each secondary metabolite. Secondary metabolites are used in anti-feeding activity, toxicity or acting as precursors to physical defense systems. Flavonoids are a class of secondary metabolites with basic structure of two aromatic rings and an oxygen atom and have potential antibacterial and antiviral activities. Coumarin is a fragrant organic chemical compound in the benzopyrone chemical class, which is a colorless crystalline substance in its standard state. It is a natural substance found in many plants and have bacteriostatic and anti-tumour activity makes these compounds attractive for further backbone derivatization and screening as novel therapeutic agents. In the present study callus induction was done by using various plant growth regulators like 2, 4-D, IAA, NAA in different concentrations. Elicitation of secondary metabolites done by difference concentration of Ozone. HPLC analysis was carried out to determine the metabolites. The present study showed that *in vitro* approach could be an alternative for flavonoids and coumarins production in *Chrysanthemum morifolium* and *Chrysanthemum indicum* leaf explants which include advantages such as supply of product independent of the availability of plant, climate and geographical location and this would

extend the feasibility to scale up production of flavonoids and coumarins on commercial scale utilizing bioreactors in future.

REFERENCE:

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