

***IN VITRO* PHYSIOLOGICAL AND CYTOLOGICAL  
STUDIES ON SOME AROMATIC PLANTS**

***BY***

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# Abstract

## **Title: *In Vitro* Physiological and Cytological Studies on Some Aromatic Plants**

### **ABSTRACT**

Growing and healthy parts of either lavender or thyme plants were taken and sterilized. Explants i.e. leaf discs, internode cuttings and root cuttings were prepared and cultured on different medium types. Different anti-oxidant treatments, cold treatments, auxin types, 2,4-D concentrations, cytokinin types and BAP concentrations were used. Although, these treatments were succeeded with lavender, they failed with thyme plant as they gave low quantity of Callus and further experiments were done only on lavender, and their combinations were studied on Callus formation parameters of lavender. Moreover, different additives (Malt extract, Casein hydrolysate, Yeast extract, and Coconut oil) were used during Callus induction (Callus development). Meanwhile, hormonal balance (combination between NAA & BAP at different concentrations) were studied during plantlets regeneration. In the same time, different cytokinin types and BAP concentrations were studied on Proliferation as well as different GA<sub>3</sub> concentrations, auxin types and concentrations of IBA were evaluated on lavender Rooting. On the other hand, different additives and storing Callus for different periods were evaluated to study their effect on oil content percentages and chemical composition.

It was found that pre-treated leaf discs with anti-oxidant solution as well as cold treatments and culturing on modified Murashige & Skooge medium supplemented with either 2.0 mg/L 2,4-D or 0.5 mg/L BAP or combination of both enhanced the highest Callus formation. Culturing of mature Callus on the medium contained 300 mg/L Yeast extract improved Callus development. Culturing of the well developed Callus on medium contained 1.0 mg/L NAA plus 0.5 mg/L BAP maximized Somatic embryos formation and Plantlets regeneration. Moreover, adding 2.0 mg/L BAP maximized proliferation. Similarly, adding 2.0 mg/L GA<sub>3</sub> maximized Shoot elongation and 2.0 mg/L IBA enhanced Rooting.

Furthermore, culturing matured Callus on medium supplemented with 300 mg/L Yeast extract as well as stored Callus for 6 months maximized oil percentage and improved oil composition in lavender. Storing callus for 6 months decreased similarity up to (60%).

**Key Words:** lavender, thyme, *in vitro*, and oil content.