



University of Zabol  
Graduate school  
Faculty of Agriculture  
Department of Plant Breeding and Biotechnology

**Thesis Submitted in partial Fulfillment of the Requirement for the Degree of  
PhD in Biotechnology in Agriculture**

**Micropropagation, phytochemical screening and  
determination of transcription starting point sequence of  
*anti-HIV* gene in carela (*Momordica charantia*) medicinal  
plant**

**Supervisors:**

Dr. B. Fakhri  
Dr. H. Kamaladini

**Advisors:**

Dr. M. Solouki  
Dr. F. Haddadi

**By:**

M. Mobasseri moghadam

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## **Abstract**

Nowadays, medicinal plants have been considered due to less side effects on health. Tissue culture optimization from some of these plants from seeds explants, can lead to commercial secondary metabolites products and genetic modification of these valuable plants. Karela is from the family of *Cucurbitaceae* and scientifically named as *Momordica charantia* which is known due to its valuable secondary metabolites and medicinal properties, can play an important role in the agricultural sector. In this study, Callus induction and plant regeneration were studied using MS medium containing different concentrations of 2,4 D and BAP hormones. Secondary metabolites were detected using mass spectrometry (GC-MS) from cell suspension, roots, leaves and fruit. (GC-MS) results indicate, 49 compounds in roots, 46 compounds in fruits, 40 compounds in callus cell suspension and 37 compounds in leaves. Tissue culture results showed that the highest callogenesis was obtained at a concentration of 3 mg / l. 2,4-D and the highest mean number of direct branches per sample was obtained with 2 mg / l BAP. Also the highest amount of rooting was obtained at a concentration of 1 mg / l containing IBA hormone.

**Keywords:** Callus induction, direct regeneration, optimization of tissue culture, secondary metabolites