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Potential Anticancer Agent: Propagation, Isolation and Characterization of Catechin from *in vitro* *Arbutus andrachne* L.

Background

Cancer is one of the most devastating diseases. Chemotherapy is playing an essential role in cancer treatment particularly when cancer is metastasized. Most of anticancer drugs, either directly or indirectly, are related or being isolated from natural plants. Catechin, antioxidant, and potential anticancer drug, is found in a wide variety of plant sources such as vegetables, herbs, teas and was isolated from bark and leaves of *Arbutus andrachne.* Evidence for the potential antioxidant activities suggests that the dietary intake and therapeutic use of catechins can be associated with a lower risk of colorectal cancer. In Palestine, *A. Andrachne* is an endangered wild plants. We are mainly interested in saving endangered plants in Palestine and enrich secondary metabolites production with highly therapeutic use. We utilized *in vitro* propagation technique for conservation of endangered *A.andrachne* plant and worked for enhancing the production of (+)-catechin. The quantitative production of catechin was followed by TLC and HPLC and compared with wild *A. andrachne* plant.

Objectives

1. Establishing micropropagation, and callus induction protocols
2. Identification and characterization of catechin from *in vitro* plant by TLC and HPLC and compared with wild *A. Andrachne* plant.

Materials and Methods

A.andrachne plant was propagated on Woody Plant medium with different concentration of plant regulatory hormones. Catechin was extracted from *ex vitro* leaves, *in vitro* leaves and callus then identified and characterized by TLC and HPLC.

Results

In vitro leaves of *A. Andrachne* were grown on WPM with 6.0 mg/l zeatin, and callus maintained on WPM 2.0 mg/l TDZ + 0.5 mg/l NAA. TLC analysis detected the presence of catechin in EtOAc extracts from *in vitro* and *ex vitro* vegetative parts. By comparing chromatogram standard catechin with catechin from *ex vitro in vitro*, leaves, and callus, the result confirmed the presence of catechin in three plant samples of *A. andrachne.* Percentage yield of catechin was calculatedas weight (mg) of catechin per 100 mg of plant and gave this result (*in vitro* leaves = 2.5%, *ex vitro* leaves = 0.5%, and callus = 0.063%).

Conclusion

We were successful in enhancing catechin production in callus and *in vitro* plant utilizing *in vitro* propagation technique. With the help of HPLC and TLC techniques we were able to identify and characterize catechin. Reference sample of catechin was used for comparison.