

Antiproliferative and apoptotic effects of *Phyla nodiflora* extracts on human breast cancer cell line

Abstract

Introduction: Cancer is a disease of gene disorder that occurs in the normal processes of cell division. Undesirable side effects of chemotherapy and surgery have triggered the search of new compounds from plant to fight cancer because they are relatively safer than synthetic drugs. Apoptosis is a process of internally programmed cell death, which is initiated by intrinsic or extrinsic signals. It plays important roles in cancer development and treatment, thus the ability of bioactive compounds to increase the sensitivity of cancerous cells towards cellular damage and activate the apoptotic response is the most desirable. *Phylanodiflora* has been used as folk medicine for various ailments. It is known to have various biological activities such as antioxidant, antimicrobial, antitumor, anti-inflammatory, antidiabetic, and hepatoprotective and antimelanogenesis effects but their underlying molecular events are largely unknown. Objective: To study the antiproliferative and apoptosis activity of *P.nodiflora* in MCF7 cells. Methods: The leaf and stem of this plant was extracted separately using methanol and ethyl acetate. The free radical scavenging activity of the plant extracts was determined using DPPH antioxidant assay, while the proliferation assay was performed using MTT method. DNA fragmentation induced by the plant extracts was evaluated through DNA extraction. Results & Discussion: Compared to stem extracts (1.2134 mg/ml and 0.9877 mg/ml for ethyl acetate and methanol respectively), both leaf extracts exhibited lower EC50 values (0.4271 mg/ml and 0.6177 mg/ml for ethyl acetate and methanol respectively) which indicating higher antioxidant activity. MTT results showed that MCF7 cells were inhibited by all the extracts with IC50 ranging from 90-120 µg/ml. DNA extracted from treated cells showed the formation of DNA laddering suggesting the occurrence of apoptosis. Conclusion: The results suggest that *Phyla nodiflora* extracts are capable of inhibiting cancer cell growth via apoptosis.

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