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ABSTRACT BOOK
Anticancer Properties Of *Tilia cordata* On Various Cancer Cells

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**Introduction:** Plants are valuable sources of new drugs and they host a great therapeutic resource. Tilia species have a significant medicinal potentials and are widely used for the treatment of diseases such as hypertension, colds and anxiety in folk medicine. Apoptosis is programmed cell death and it is at the center of new agents in cancer treatment. p53, Bcl-2 and Bax are at the center of the apoptotic regulation, growth inhibition and differentiation. VEGF (vascular endothelial growth factor) regulates vasculogenesis and angiogenesis, and also VEGF is up-regulated in many tumors. Some Tilia species exhibited anticancer potentials on several tumoral cells and induce apoptosis. Investigation of the cytotoxic and apoptotic effects of lime on cancer cells has a great importance in understanding of molecular action mechanism of this valuable plant.

**Materials and Methods:** In this study antiproliferative and apoptotic actions of ethanol extract of *Tilia cordata* was evaluated in various cancer cell lines. The flowers and leaves of *T. cordata* were collected in Manavgat village, Karasu, Sakarya province, Turkey in 2017 and dried in without moisture conditions. The dried plant parts were extracted with ethanol. MCF-7 human breast cancer cells, A549 human lung cancer cells, PC-3 human prostate cancer cells and HT-29 human colorectal adenocarcinoma cells were grown in DMEM supplemented with 1% penicillin-streptomycin and 10% fetal bovine serum and in a humidified incubator containing 5% CO₂. Cancer cells were treated with different concentrations of *T. cordata* ethanol extract. Viability of cells was determined by WST-1 cell proliferation assay. Also clonogenic assay performed to observe the cytotoxic effectiveness of extract. Cell Death Detection Elisa Kit and Human VEGF Elisa assay was used for determination of apoptotic effects and measure the amount of VEGF in cell lines, respectively. Pure Link RNA Mini Kit was used for total RNA extraction and High Capacity cDNA Reverse Transcription Kit was used for cDNA synthesis. Gene expression levels were measured by RT-qPCR. House-keeping gene was β-actin for optimization. Each experiment was carried out independently in three times.

**Results:** The cytotoxic effect of *T. cordata* were clearly concentration dependent on different cancer cells. The ethanol extract of *T. cordata* exhibited toxicity on all tumor cell lines tested. These findings supported by clonogenic assay results (p<0.05). Especially in HT-29, MCF-7 and A549 cells, increasing of apoptotic rate was found to be significantly (p<0.05); p53, Bax and Bcl-2 gene expression levels significantly changed compared with control, while VEGF amount significantly decreased (p<0.05). In PC-3 cells, non-significant changes were seen in expression of p53, Bax and Bcl-2 genes, but a moderate increasing in the apoptosis was observed when compared with control group.

**Conclusion:** Cancer has high mortality rates and herbs can be used as reducing the side effect of cancer chemotherapy. If these findings are supported by future studies it may contribute to elucidating the molecular basis of the effects of plants on the cancer.

**Key words:** A549, WST-1, apoptosis, p53, *Tilia*. 