



University of Zabol  
Faculty of Basic Sciences

A Thesis Presented for the degree of Genetics (MSC)

**Berberis vulgaris fruit extract cytotoxic effect on human breast cancer cell line  
(MCF-7) and evaluation of TP53 and MDM4 genes expression**

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## **Abstract**

.Previous research has shown that *Berberis vulgaris* extract can inhibit the growth of cancer cell. The present study investigated the cytotoxic activity of *Berberis vulgaris* fruit extract on a human Breast cancer cell line (MCF-7). MTT assay was carried out to assess *in vitro* cytotoxicity. Apoptosis was investigated using flow cy-tometry, fluorescence microscopy, qPCR and Caspases activity. The results showed that Barberry fruit extracts significantly induced apoptosis in the MCF-7 cancer Cell line.

**Key Word:** Breast cancer, *Berberis vulgaris* , Caspas, Apoptosis, *TP53*, *MDM4*