**In vitro Valuation of Toxic Effects of Fennel (Foeniculum vulgare Miller.) Seed Decoctions on Plant and Human Cells**

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**Abstract**

The medicinal plants have been used since ancient times and are still utilized by the majority of the population. Hence, it is essential to investigate the cytotoxic and genotoxic effects of these plants. The aim of this study was to evaluate the toxic effects of fennel seeds decoctions, traditionally used in Iran as an herbal remedy. The cytotoxicity was tested in vitro using Allium cepa L. roots and human cells and genotoxicity were evaluated using A. cepa L. roots. The seeds decoctions were prepared in the traditional method and in two concentrations, commonly used in Iran (CC) and 10 times concentration (10C). The A. cepa L. root tips were treated with the decoctions and the mitotic index (MI) and chromosome aberrations were assessed. Human lymphocytes and human bone marrow endothelial cell line (HBMEC) were also treated with the extracts and the cell viabilities were measured using trypan blue and lactate dehydrogenase (LDH) assays, respectively. Although both of the extracts decreased MI in the A. cepa L. root tip cells, only the 10C extract significantly increased chromosomal aberrations. In addition, dilutions 1:30, 1:62.5, 1:125 and 1:250 from the 10C extract were 100% cytotoxic to the human lymphocyte cells, however for the CC extract, only dilution 1:30 showed cytotoxic effects. The 1:30 dilution of the 10C extract caused 65% toxicity in HBMEC and none of the CC extract dilutions were toxic to these cells. The tested decoctions showed some cytotoxic and genotoxic effects and the safe dosage of the traditional decoctions needs to be precisely evaluated.

**Key words:** Foeniculum vulgare Miller., Allium cepa L., Cytotoxic, Genotoxic.