



## Evaluation of cytotoxicity and anti-cancer effect of *Ferula szowitsiana* methanolic extract on lung cancer A549 cell-lines

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**Background and Aims:** Cancer causes significant morbidity and mortality and is a major public health problem worldwide. Lung cancer has the most mortality rate among other types of cancer in the world. Plant-derived compounds have been an important source of several clinically useful anti-cancer agents. Among these, *Ferula szowitsiana* has been used in various traditional medicines around the world. In this study, we studied the growth inhibitory effect of *F.szowitsiana*'s anti-tumor activity using human lung cancer cell line A549.

**Methods:** For this aim cells were exposed to methanol extract at different concentration and for different time durations. Along with morphologic evaluation of the cultured cells, MTT assay were carried out to characterize the cytotoxicity of the extract used. Expression of apoptosis related genes such as bcl-2, bcl-XL, bax and p53 as well as 18s housekeeping gene was studied using reverse transcriptase-QPCR.

**Results:** Our results showed that methanol extracts of *F.szowitsiana* inhibited A549 cell proliferation in a concentration-dependent manner. Upon treatment with extract, a clear difference was observed in cellular morphology; the cells acquired more attenuated architecture. Our MTT assay results showed a significant cytotoxicity effect in a time and concentration dependent manner.

**Conclusions:** Based on the results of cellular (microscopic and MTT assay) as well as molecular experiment (RT-QPCR) carried out in this study we could demonstrate that *F.szowitsiana* methanol extract has in vitro cytotoxic activity and inhibitory effect on the growth of human lung cancer cell line A549. As evidenced from these preliminary results, this medicinal plant and its bioactive constituents may be considered as attractive alternatives to serve as lead compounds in drug development for human lung cancer as an adjuvant therapy. However, much remains to be done before such agent could be introduced to the clinic.

**Keywords:** Human lung cancer; *Ferula Szowitsiana*; A549 Cell Line; RT-QPCR; Apoptosis