

Summary of the MSc thesis No:9925 Faculty of Veterinary Medicine, Urmia University.

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**Title:** The effect of black cumin essential oil on the growth and proliferation of mesenchymal stem cells and the effect of its supernatant on the LNCap cell line

**Background:** It has been reported in many studies that mesenchymal stem cells have great anti-tumor effects, certainly environmental factors have the ability to influence the function of mesenchymal stem cells. Black cumin is a plant that was used in traditional medicine as anti-diarrhea and anti-flatulence, and this plant has the ability to fight pathogenic microbes. In this study, the effect of black cumin essential oil on the survival of mesenchymal stem cells and also the effect of mesenchymal stem cell on prostate cancer cell line LNCap were investigated.

**Materials and methods:** Mesenchymal stem cells were isolated from femur and tibia bones of mice and MSC were cultured, after 21 days these cells were treated for 48 hours with different doses of black cumin essential oil (0.5-50-500-500 micrograms/ml). The survival rate of mesenchymal stem cells was checked by MTT test method. Then the mesenchymal stem cells were incubated for 48 hours without fetal bovine serum and their supernatant was collected. The production of nitric oxide by stem cells was investigated as well, then the effect of the supernatant of these cells, on cancer cells. was measured by MTT test.

**Results:** During the investigations conducted by MTT and NR test, it was observed that black cumin essential oil in concentrations of 50 and 500 micrograms reduces the growth and proliferation of mesenchymal stem cells, and this essential oil also increases the production of NO free radicals. It is produced by mesenchymal stem cells. The supernatant of stem cells reduces the growth and proliferation of cancer cells in all concentrations.

**Conclusion:** Our observations show that black cumin essential oil reduces the growth and proliferation of mesenchymal stem cells, and also the supernatant of mesenchymal stem cells reduces the growth and proliferation of LNCap cell line.

Key words: Black cumin, Essential oil, Mesenchymal stem cells, Proliferation, Prostate cancer