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Cytotoxic effects of different solvents and essential oil of eucalyptus on human fibroblast cells

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Abstract

Background: There are reports that essential oils of different species of eucalyptus have special properties including anti-bacterial, antiviral, anticancer and insecticidal activities. Most of plant essential oils are dissolved in polar or non-polar solvents before examination.

Objective: The aim of this study was to determine the cytotoxic effects of different solvents and essential oil of eucalyptus on human fibroblast cells.

Methods: This experimental study was performed in the Institute of Biotechnology affiliated to Iranian Research Organization for Science and Technology during 2013-2014. The studied solvents were including ethanol, propylene glycol, dichloromethane, and dimethyl sulfoxide. Fibroblast cells were seeded in 96-well plates. After 24 h incubation at 37ºC, the cells were treated with different concentrations of the solvents or essential oil of eucalyptus (0.05-1 mg/ml). The viability of the cells was determined by the colorimetric MTT assay. Data were analyzed using T-test and One-way ANOVA.

Findings: The lowest cytotoxic effect against fibroblast cells was related to 1% ethanol and propylene glycol, while the highest cytotoxic effect was related to 10% dimethyl sulfoxide that decreased cell survival by 47%. Essential oil of eucalyptus also induced fibroblast cell death at concentrations higher than 0.05 mg/ml.

Conclusion: For clinical application of essential oil of eucalyptus, using solvent with appropriate concentration is necessary to prevent its cytotoxic effects.

Keywords: Eucalyptus, Solvents, Fibroblasts

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