

## Effectiveness of *Opuntia microdasys* plant in elimination of BTEX from air using SPME-GC-FID

M. Mosaddegh<sup>1</sup>, A. Jafarian<sup>2</sup>, A. Ghasemi<sup>3,\*</sup>

<sup>1</sup>Pharmacology Department, Medical School, Yazd Shahid Sadoughi Medical Sciences University, Yazd, Iran

<sup>2</sup>Toxicology Department, Pharmacy School, Isfahan University of Medical Sciences, Isfahan, Iran

<sup>3</sup>Pharmacy School, Isfahan University of Medical Sciences, Isfahan, Iran

**Background and Aims:** This research seeks to investigate the effectiveness of *Opuntia Microdasys* in decreasing the levels of benzene, toluene, ethylbenzene and xylene from air by comparing the results with that soil alone.

**Methods:** A chamber was used to contain the plant in a sealed environment. The air in the chamber was contaminated with the BTEX (0.8ppm) by injecting the proper microliter of them through a plastic septum. A battery-operated fan was placed in the chamber for continuous air circulation. The fan was controlled using remote control. After contamination the chamber was allowed to equilibrate for one hour before placing the plant inside the chamber. Control experiments were done to ensure that the chamber is sealed well. The initial BTEX concentrations were measured using SPME-GC-MS. Then, the BTEX concentrations were periodically measured with the same method.

**Results:** While several studies have already been done to provide information about effectiveness of various air-purifying plants, *Opuntia Microdasys* hasn't been through any scientific experiment to prove its ability. Thus there was a definite need for a research to be conducted on *Opuntia Microdasys*. According to the results of the chamber experiments, *Opuntia Microdasys* removed BTEX from the air inside the chamber completely after the first two days. In this study an experiment was done by putting the only soil in the chamber to compare the effectiveness of the soil alone and the plant. There was a significant difference between the ability of soil alone with the plant for removing of BTEX from air.

**Conclusions:** This study demonstrates the capacity of indoor plants for removing air pollutants such as BTEX from air. Also, it seems a noble and a purposeful task that not an artificial but a natural method was researched for an indoor air purification system.

**Keywords:** *Opuntia Microdasys*; BTEX; SPME-GC-FID