

Evaluation of Fusaric Acid Genotoxicity using Chromosomal Aberration Assay in Human Lymphocytes

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Aim of the study: Given the importance of the sustainable use of biodiversity for food and agriculture, the biodiversity has critical role in sustainable intensification of agricultural production. However, agricultural products consumed by human and animal can be contaminated by secondary fungal metabolites called mycotoxin. Such a contamination not only harm agricultural production and food resources but also human and animal health. Fusaric acid (5-butylpicolinic acid) (FA) is a mycotoxin produced by various *Fusarium* species especially *Fusarium moniliforme* growing on corn. The presence of mycotoxins in foodstuffs is a major concern for food safety. Therefore, determination of genotoxic and mutagenic effects of mycotoxins are very important for human health. This study was undertaken to evaluate genotoxic effect of FA in human lymphocytes in vitro using chromosome aberrations (CAs) assay.

Material and Methods: Cells were treated with 0.78, 1.56, 3.125, 6.25, 12.5, 25, 50, 100, 200, and 400 µg/mL concentrations of FA, as well as a solvent [DMSO, 0.5% (v/v) of the culture medium], a negative and a positive controls (Mitomycin-C, 0.20 µg/mL). This study was approved by the ethical committee of the Faculty of Medicine, Gazi University (26.05.2014-277).

Results: Fusaric acid did not significantly increase the number of CA and the frequency of abnormal cells at 24 h treatment. At 48 h treatment, on the other hand, FA significantly increased the number of CA and the frequency of abnormal cells at only 6.25 µg/ml concentration compared to negative control. When compared to solvent control, FA did not affect chromosome aberrations in all the treatments. FA showed toxic effect in human lymphocytes at 25 µg/mL concentration and over. As a result, FA ≥ 25 µg/mL was toxic, however, it did not induce genotoxic effect by CA test except at certain concentration in long treatment periods in human lymphocytes in vitro.

Acknowledgements: This study was supported by TUBITAK under the project number 114Z713.

Keywords: Fusaric acid, mycotoxin, chromosomal aberration (CA) assay.