



Category: Functional Genomics

Poster Prize Winner

# Ameliorating potential of *Equisetum arvense* against the Cyclophosphamide induced genotoxic damage in mice

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## Abstract

Medicinal plants have always been on the vanguard whether regarding the treatment of a number of ailments or even cancer. It has been suggested that the use of antimutagens/anticarcinogens in everyday life can be the most effective way to avert human cancer and genetic diseases. *Equisetum arvense*, commonly known as the field horsetail or common horsetail (Sehetband or Brahm Gund locally in Kashmir), is a very common, bushy perennial herb native to the northern hemisphere and rich in secondary metabolites. In the present study, we evaluated the potential of the plant *E. arvense* against the cytotoxic and mutagenic effects induced by cyclophosphamide (chemotherapeutic agent) in the bone marrow cells of mice using the Chromosome assay (CA) and Mitotic index (MI) *in vivo* as the biomarkers. *E. arvense* was subjected to extraction with hexane, ethanol and aqueous solvents. Screening for antimutagenic activity was carried out using albino mice as the model organism. Toxicological study was performed following 3 protocols: pre-treatment, simultaneous treatment and post-treatment with the three extracts of the plant and the mutagen. In order to find out the phytochemicals responsible for showing the highest antimutagenic activity, phytochemical analysis was also carried out using GC-MS. The present study was focused on evaluating the mutagenic/antimutagenic potential of the plant *Equisetum arvense* which exhibited potent antimutagenic activity against the cyclophosphamide induced mutations. Chromosomal aberrations and mitotic index were used as biomarkers to assess the mutations. In the present study mice treated with CPA showed significant increase in aberrant metaphases, CAs (including and excluding gaps), while decreased cellular proliferation rate (MI) compared to the control group. The plant extracts were not cytotoxic or mutagenic to the animal. The highest antimutagenic activity (98%) was shown by the ethanolic extract. The analysis of the effect of extracts on the cytotoxicity induced by CPA showed a significant improvement. The efficacy of present chemotherapeutics has been limited by its toxicity and for the cells developing resistance against the therapy. Because of its ability to prevent chromosomal damage, *E. arvense* is likely to open an interesting field concerning its possible use in clinical applications, most importantly in cancer as a chemopreventive agent or even as a coadjuvant to chemotherapy to reduce the side effects associated with it.

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