

2nd International Conference and Exhibition on

MARINE DRUGS AND NATURAL PRODUCTS

June 15-17, 2017 London, UK

Geraniol - A component of *Rosa alba* L. essential oil, possess anti-genotoxic activity against MNNG-induced chromosome aberrations in higher plants and cultured human lymphocytes

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Rosa alba L. is a rich source of natural antioxidants and holds promise to be successfully used in perfumery, cosmetics and pharmacy. The natural monoterpene geraniol comprises 18.28% of the *Rosa alba* L. essential oil. The compound was tested with respect to its potential to protect cells against DNA alkylating agent N-methyl-N'-nitro-N-nitrosoguanidine (MNNG), as well as to its cytotoxic and genotoxic activities in two types of test-systems: *Hordeum vulgare* and human lymphocytes *in vitro*. Such studies with physiologically different types of test-systems could provide more informative and representative assessment about the cytotoxic/genotoxic effect and protective potential of the compounds isolated from white rose essential oil against genotoxins. The objective of the study was to evaluate cytotoxic/clastogenic effect and anti-cytotoxic/anti-clastogenic potential of geraniol (ethanolic extract) evaluated by chromosome aberration test in barley (reconstructed karyotype MK14/2034) and cultured human lymphocytes. Two types of experimental schemes were applied: single treatment with compounds, conditional treatment with geraniol prior to challenge with MNNG with or without 4 h inter-treatment time. The presented data reveals no cytotoxic effect in all geraniol individual treatment variants compared with untreated control. Geraniol shows anti-clastogenic potential against MNNG induced chromosomal aberrations in both test-systems. It is effective in concentration range of 25, 50 and 100 µg/ml and shows a substantial impact after conditional treatment prior to MNNG (50 µg/ml) without or with 4h inter-treatment time. The frequency of chromosome aberrations was decreased in dependence of the concentration applied and the treatment variant. 34-60% less injury was detected in lymphocytes and 53-75% in barley compared with the challenging treatment with MNNG alone. These investigations, concerning the anti-cytotoxic and anti-genotoxic potential of geraniol could be useful in health research on the pharmacological capacity and activity of the present and other natural plant compounds.

Biography

Svetla Gateva has experience in the field of genotoxicity screening and risk assessment of various environmental contaminants using human lymphocytes as a test-system. She has experience with classical cytogenetic techniques (chromosome aberrations, micronuclei) and molecular methods (comet analysis and gel electrophoresis in a constant electric field/CFGE).

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