DNA and Cell Biology

Volume ٢٧, Issue ١٢, ١ December ٢٠٠٨, Pages ٦٥٧-٦٦٤

Protective effect of Crocus sativus stigma extract and crocin (trans-crocin ٤) on methyl methanesulfonate-induced DNA damage in mice organs

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View references (٧٩)

Abstract

This study was designed to examine the effect of aqueous extract of Crocus sativus stigmas (CSE) and crocin (trans-crocin ٤) on methyl methanesulfonate (MMS)-induced DNA damage in multiple mice organs using the comet assay. Adult male NMRI mice in different groups were treated with either physiological saline (١٠ mL/Kg, intraperitoneal [ip]), CSE (٨٠ mg/Kg, ip), crocin (٤٠٠ mg/Kg, ip), MMS (١٢٠ mg/Kg, ip), and CSE (٥, ٢٠, and ٨٠ mg/Kg, ip) ٤٥ min prior to MMS administration or crocin (٥٠, ٢٠٠, and ٤٠٠ mg/Kg, ip) ٤٥ min prior to MMS administration. Mice were sacrificed about ٣ h after each different treatment, and the alkaline comet assay was used to evaluate the effect of these compounds on DNA damage in different mice organs. The percent of DNA in the comet tail (% tail DNA) was measured. A significant increase in the % tail DNA was seen in nuclei of different organs of MMS-treated mice. In control groups, no significant difference was found in the % tail DNA between CSE- or crocin-pretreated and saline-pretreated mice. The MMS-induced DNA damage in CSE-pretreated mice (٨٠ mg/Kg) was decreased between ٢,٦٧-fold (kidney) and ٤,٤٨-fold (lung) compared to those of MMS-treated animals alone ($p < ٠,٠٠١$). This suppression of DNA damage by CSE was found to be depended on the dose, which pretreatment with CSE (٥ mg/Kg) only reduced DNA damage by ٦,٩٧٪, ٦,٥٧٪, ٧,٢٧٪, and ٩,٩٠٪ in liver, lung, kidney, and spleen, respectively ($p > ٠,٠٥$ as compared with MMS-treated group). Crocin also significantly decreased DNA damage by MMS (between ٤,٦٩-fold for liver and ٦,٥٥-fold for spleen, ٤٠٠ mg/Kg), in a dose-dependent manner. These data indicate that there is a genoprotective property in CSE and crocin, as revealed by the comet assay, in vivo.

Reaxys Database Information

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Indexed Keywords

EMTREE drug terms: crocin; Crocus sativus extract; mesylic acid methyl ester

EMTREE medical terms: animal experiment; article; controlled study; DNA damage; drug effect; immunosuppressive treatment; male; mouse; nonhuman; priority journal; protection

MeSH: Animal Structures; Animals; Carotenoids; Crocus; Cytoprotection; DNA Damage; Dose-Response Relationship, Drug; Drug Evaluation, Preclinical; Flowers; Male; Methyl Methanesulfonate; Mice; Mutagens; Plant Extracts

Medline is the source for the MeSH terms of this document.

Species Index: Animalia; Crocus sativus; Mus

Chemicals and CAS Registry Numbers: crocin, ٣٩٤٦٥-٠٠-٤, ٤٢٥٥٣-٦٥-١; mesylic acid methyl ester, ٦٦-٢٧-٣;Carotenoids, ٣٦-٨٨-٤; crocin, ٤٢٥٥٣-٦٥-١; Methyl Methanesulfonate, ٦٦-٢٧-٣; Mutagens; Plant Extracts

ISSN: ١٠٤٤٥٤٩٨ **CODEN:** DCEBE **Source Type:** Journal **Original language:** English