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Biogerontology • Volume 22, Issue 1, Pages 19 - 34 • February 2021

Document type

Article

Source type

Journal

ISSN

13895729

DOI

10.1007/s10522-020-09898-4

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Partially saturated canthaxanthin alleviates aging-associated oxidative stress in d-galactose administered male wistar rats

Mathimaran, Ahila^{a, c}; Kumar, Anbarasu^a ; Prajapati, Gurudayal^b; Ampapathi, Ravi S.^{b, d};

Bora, Himangsu K.^c; Guha, Rajdeep^{c, d}

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^a Department of Biotechnology, Periyar Maniammai Institute of Science & Technology, Vallam, Thanjavur, Tamil Nadu, India

^b Sophisticated Analytical Instrument Facility, CSIR-Central Drug Research Institute (CSIR-CDRI), Lucknow, Uttar Pradesh, India

^c Laboratory Animal Facility, CSIR-Central Drug Research Institute (CSIR-CDRI), Lucknow, Uttar Pradesh, India

^d CSIR-Academy of Scientific and Innovative Research (CSIR-AcSIR), Ghaziabad, Uttar Pradesh, India

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Abstract

It has been earlier reported that partially saturated canthaxanthin (PSC) from *Aspergillus carbonarius* mutant is non-toxic, has anti-lipid peroxidation activity and can induce apoptosis in prostate cancer cell lines. In the present study, the antiaging effect of PSC was explored in d-galactose administered male wistar rats. 8–10 weeks old, male wistar rats were randomly divided into (i) Vehicle Control Group (VCG), (ii) Aged Control Group (ACG), (iii) Aged + α Lipoic Acid Group (ALG) and (iv) Aged + Partially saturated canthaxanthin Group (APG). Rats received d-galactose (300mg/kg bwt/day; i.p.) alone (ACG) or together with PSC (APG) (20mg/kg bwt/day; oral) and α Lipoic Acid (ALG) (80mg/kg bwt/day; oral) for 10 weeks. Rats in VCG were injected with the same volume of physiological saline (i.p.) and fed with olive oil (vehicle). In vitro protein oxidation and DNA oxidation inhibition, in vivo malondialdehyde (MDA), superoxide dismutase (SOD), glutathione peroxidase (GSH-Px), catalase (CAT), acetylcholinesterase (AChE) and monoamine oxidase (MAO) activities were determined. In addition, brain neurotransmitters, dopamine and serotonin were estimated by NMR. PSC treatment showed inhibition against protein and DNA oxidation. PSC effectively improved d-galactose induced aging rats by inducing a protective effect through up-regulation of glutathione peroxidase (GSH-Px), superoxide dismutase (SOD), catalase (CAT) and brain neurotransmitters and downregulated malondialdehyde (MDA) and monoamineoxidase (MAO) levels. Thus, PSC appears to be a functional compound having antioxidant and antiaging properties. © 2020, Springer Nature B.V.

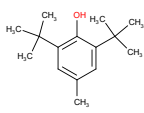
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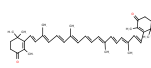
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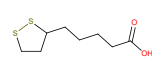
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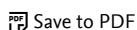
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