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Effect of Ocimum americanum Water Extract on Antioxidant System in Rat

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Abstract : Several dietary and herbal plants have been shown to possess cytoprotective and antioxidant effects with various mechanisms of action. The aim of this study was to determine the antioxidant effects and its mechanism of aqueous leaves extract of Ocimum americanum (OA), commonly known as American basil or 'hoary basil', in rat. The extract was screened for its phytochemical contents and antioxidant activity in vitro. Moreover, the extract was studied in rats to evaluate its effects in vivo. Rats were orally administered with the extract at the dose of 100, 200 and 400 mg/kg for 28 days. Phytochemical screening of plant extracts revealed the presence of alkaloid, cardiac glycosides, tannin and steroid compounds. The extract contained phenolic compounds 36.91 ± 0.66 mg of gallic acid equivalents per gram OA extract. The free radical scavenging activity assessed by DPPH assay gave IC50 of 41.27 ± 1.86 µg/mL, which is relatively lower than that of BHT with IC50 of 12.34 ± 1.14µg/mL. In the animals, the extract was well tolerated by the animals throughout the 28 days of study as shown by normal serum levels AST, ALP, ALT, BUN and Cr as well as normal histology of liver and pancreatic and kidney tissue. The protein expression of antioxidant enzymes, γ-glutamylcysteine ligase (γ-GCL) in liver was significantly increased compared with normal control. Consistent with the induction of γ-GCL protein expression significantly reduction of serum oxidative stress marker malondialdehyde (MDA) was found in rat treated with OA extract compared with control. Taken together, this study provides evidence that Ocimum americanum exhibits direct antioxidant properties and can induce cytoprotective enzyme in vivo.

Keywords : antioxidant, γ-glutamylcysteine ligase, MDA, Ocimum americanum
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