Strobilanthes crispus attenuates renal carcinogen, iron nitrilotriacetate (Fe-NTA)-mediated oxidative damage of lipids and DNA

Abstract

This study was aimed to evaluate the effect of Strobilanthes crispus extract for possible protection against lipid peroxidation and DNA damage induced by iron nitrilotriacetate (Fe-NTA) and hydrogen peroxide (H2O2). Fe-NTA is a potent nephrotoxic agent and induces acute and subacute renal proximal tubular necrosis by catalyzing the decomposition of H2O2-derived production of hydroxyl radicals, which are known to cause lipid peroxidation and DNA damage. Incubation of postmitochondrial supernatant and/or calf thymus DNA with H2O2 (40 mM) in the presence of Fe-NTA (0.1 mM) induces lipid peroxidation and DNA damage to about 2.3-fold and 2.9-fold, respectively, as compared to control (P < 0.05). In lipid peroxidation protection studies, S. crispus treatment showed a dose-dependent inhibition (45-53% inhibition, P < 0.05) of Fe-NTA and H2O2 induced lipid peroxidation. Similarly, in DNA damage protection studies, S. crispus treatment also showed a dose-dependent inhibition (18-30% inhibition, P < 0.05) of DNA damage. In addition, the protection was closely related to the content of phenolic compounds as evident by S. crispus extract showing the value of 124.48 mg/g total phenolics expressed as gallic acid equivalent (GAE, mg/g of extract). From these studies, it is concluded that S. crispus inhibits peroxidation of membrane lipids and DNA damage induced by Fe-NTA and H2O2 and possesses the potential to be used to treat or prevent degenerative diseases where oxidative stress is implicated. © 2010 Springer Science+Business Media, LLC.