Eleusine indica L . possesses antioxidant activity and precludes carbon tetrachloride (CCl 4)-mediated oxidative hepatic damage in rats

Abstract

Objectives: The purpose of this study was to evaluate the ability of aqueous extract of Eleusineindica to protect against carbon tetrachloride (CCl $_4$)-induced hepatic injury in rats. Methods: The antioxidant activity of E. indica was evaluated using the 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging assay. The total phenolic content of E. indica was also determined. Biochemical parameters [e.g. alanine aminotransferase (ALT), aspartate aminotransferase (AST), malondialdehyde (MDA), glutathione (GSH), catalase, glutathione peroxidase, glutathione reductase, glutathione S-transferase and quinone reductase] were used to evaluate hepatic damage in animals pretreated with E. indica and intoxicated with CCl $_4$. CCl $_4$-mediated hepatic damage was also evaluated by histopathologically. Results: E. indica extract was able to reduce the stable DPPH level in a dose-dependent manner. The half maximal inhibitory concentration (IC 50) value was 2350 µg/ml. Total phenolic content was found to be 14.9 ± 0.002 mg/g total phenolic expressed as gallic acid equivalent per gram of extract. Groups pretreated with E. indica showed significantly increased activity of antioxidant enzymes compared to the CCl $_4$-intoxicated group ($p < 0.05$). The increased levels of serum ALT and AST were significantly prevented by E. indica pretreatment ($p < 0.05$). The extent of MDA formation due to lipid peroxidation was significantly reduced ($p < 0.05$), and reduced GSH was significantly increased in a dose-dependently manner ($p < 0.05$) in the E. indica-pretreated groups as compared to the CCl $_4$-intoxicated group. The protective effect of E. indica was further evident through decreased histopathological alterations in the liver . Conclusion: The results of our study indicate that the hepatoprotective effects of E. indica might be ascribable to its antioxidant and free radical scavenging property.