Effect of methanol extract of Dicranopteris linearis against carbon tetrachloride-induced acute liver injury in rats

ABSTRACT

Background: Dicranopteris linearis (family Gleicheniaceae) has been reported to possess anti-inflammatory and antioxidant activities but no attempt has been made to study its hepatoprotective potential. The aim of the present study was to determine the hepatoprotective effect of methanol extracts of D. linearis (MEDL) against carbon tetrachloride (CCl4)-induced acute liver injury in rats. Methods: 6 groups ($n = 6$) of rats received oral test solutions: 10% dimethyl sulfoxide (DMSO), 200 mg/kg silymarin, or MEDL (50, 250, and 500 mg/kg), once daily for 7 consecutive days, followed by hepatotoxicity induction with CCl4. Blood and liver were collected for biochemical and microscopic analysis. The extract was also subjected to antioxidant studies (e.g. 2, 2-diphenyl-1-picrylhydrazyl (DPPH)- and superoxide anion-radical scavenging assays, oxygen radical absorbance capacity (ORAC) test and total phenolic content (TPC) determination), phytochemical screening and HPLC analysis. Results: Pretreatment with MEDL and silymarin significantly ($P < 0.05$) reduced the serum levels of AST, ALT and ALP, which were increased significantly ($P < 0.05$) in DMSO-pretreated group following treatment with CCl4. Histological analysis of liver tissues in groups pretreated with MEDL and silymarin showed mild necrosis and inflammation of the hepatocytes compared to the DMSO-pretreated group (negative control group). The MEDL showed higher DPPH- and superoxide anion-radical scavenging activity as well as high TPC and ORAC values indicating high antioxidant activity. Conclusions: MEDL exerts hepatoprotective activity that could be partly contributed by its antioxidant activity and high phenolic content, and hence demands further investigation.

Keyword: Dicranopteris linearis; Methanol extract; Carbon tetrachloride; Antioxidant; Hepatoprotective effect